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Foreword

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

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

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- x the first digit:
 - 1 presented to TSG for information;
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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies requirements for support of Radio Resource Management for the FDD and TDD modes of Evolved UTRA. These requirements include requirements on measurements in UTRAN and the UE as well as requirements on node dynamical behaviour and interaction, in terms of delay and response characteristics.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.

Modulation"

• For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.

[1]	3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode"
[2]	3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) protocol specification".
[3]	3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures"
[4]	3GPP TS 36.214: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements"
[5]	3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception"
[6]	3GPP TS 25.302: "Services provided by the Physical Layer".
[7]	3GPP TS 25.331: "RRC Protocol Specification".
[8]	3GPP TS 45.008: "Radio subsystem link control".
[9]	3GPP TS 45.005: "Radio transmission and reception".
[10]	3GPP TS 45.010: "Radio subsystem synchronization".
[11]	3GPP2 C.S0024-B: "cdma2000 High Rate Packet Data Air Interface Specification".
[12]	3GPP2 C.S0002-D: "Physical Layer Standard for cdma2000 Spread Spectrum Systems - Release A".
[13]	3GPP2 C.S0033-B: "Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Terminal".
[14]	3GPP2 C.S0011-C: "Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Stations".
[15]	3GPP2 C.S0005-D: Upper Layer (Layer 3) Signaling Specification for cdma2000 Spread Spectrum Systems
[16]	3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and

[17]	3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".
[18]	3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".
[19]	3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".
[20]	3GPP TS 25.214: "Physical layer procedures (FDD)".
[21]	3GPP TS 36. 212 "Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding".
[22]	3GPP TS 36.302: "Evolved Universal Terrestrial Radio Access (E-UTRA); Services provided by the physical layer".
[23]	3GPP TS 36.521-3: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Radio Resource Management conformance testing".
[24]	3GPP TS 36.355: "Evolved Universal Terrestrial Radio Access (E-UTRA); LTE Positioning Protocol (LPP)".
[25]	3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2"
[26]	3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
[27]	3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Radio measurement collection for Minimization of Drive Tests (MDT); Overall description; Stage 2"
[28]	3GPP TS 36.423: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 Application Protocol (X2AP)".
[29]	3GPP TS 25.101: "UE Radio transmission and reception (FDD)".
[30]	3GPP TS 36.104: "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception".
[31]	3GPP TS 36.306: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities".
[32]	IEEE Standard 802.11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications.
[33]	3GPP TS 23.303: "Technical Specification Group Services and System Aspects; Proximity-based services (ProSe); Stage 2".
[34]	3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [26] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [26].

Any Cell Selection state: as defined in TS 36.304 [1]

Asynchronous Dual Connectivity: As defined in TS 36.331 [2].

Carrier aggregation: aggregation of two or more component carriers in order to support wider transmission bandwidths TS 36.104 [30].

CEMode A Applicability: In this version of this specification the requirements for CEMode A shall apply provided the UE category M1 is configured with CEMode A, SCH $\hat{E}s/Iot \ge -6$ dB and CRS $\hat{E}s/Iot \ge -6$ dB. The CEMode A and the number of repetition levels for different physical channels are defined in [3].

CEMode B Applicability: In this version of this specification the requirements for CEMode B shall apply provided the UE category M1 is configured with CEMode B, SCH $\hat{E}s/Iot \ge -15$ dB and CRS $\hat{E}s/Iot \ge -15$ dB. The CEMode B and the number of repetition levels for different physical channels are defined in [3].

Dual Connectivity: As defined in TS 36.331 [2].

Enhanced coverage Applicability: In this version of this specification the requirements for enhanced coverage in idle mode shall apply provided the UE category M1 is with the radio condition that SCH \hat{E} s/Iot \geq -15 dB and CRS \hat{E} s/Iot \geq -15 dB.

Extended IDLE-mode DRX: extended DRX cycles in IDLE mode as specified in TS 24.008 [34], where one extended DRX cycle is a time period between two first paging occasions within two consecutive PTWs.

Extended CONNECTED-mode DRX: extended DRX cycles in CONNECTED mode as specified in TS 36.331 [2].

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

Inter-band carrier aggregation: carrier aggregation of component carriers in different operating bands TS 36.104 [30].

Intra-band contiguous carrier aggregation: contiguous carriers aggregated in the same operating band TS 36.104 [30].

Intra-band non-contiguous carrier aggregation: non-contiguous carriers aggregated in the same operating band TS 36.104 [30].

IDC autonomous denial subframes: The maximum number of uplink subframes in which the UE is allowed not to transmit E-UTRAN signals when configured with IDC autonomous denial (TS 36.331 [2]).

IDC autonomous denial validity: It is the period over which the autonomous denial subframes are counted (TS 36.331 [2]).

IDC solution: This refers to DRX or IDC autonomous denial configured by eNodeB in response to receiving InDeviceCoexIndication from the UE (TS 36.331 [2]).

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

Master Cell Group: As defined in TS 36.331 [2].

Master eNB: As defined in TS 36.300 [25].MBSFN ABS: ABS configured in MBSFN-configurable subframe.

Non-MBSFN ABS: ABS configured in any downlink subframe.

Normal coverage Applicability: In this version of this specification the requirements for normal coverage in idle mode shall apply provided the UE category M1 is with the radio condition that SCH $\hat{E}s/Iot \ge -6$ dB and CRS $\hat{E}s/Iot \ge -6$ dB. **Normal Performance Group:** For UE which supports Increased UE carrier monitoring UTRA or E-UTRA the group of inter-frequency carriers or inter-RAT carriers is divided into two groups. The group which has a better delay performance compared to the other group is referred to as the normal performance group

Paging Time Window: As defined in TS 24.008 [34].

Primary Cell: As defined in TS 36.331 [2].

ProSe Direct Communication: As defined in TS 23.303 [33]

ProSe Direct Discovery: As defined in TS 23.303 [33]

Primary SCell: As defined in TS 36.331 [2].

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

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

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

Secondary Cell: As defined in TS 36.331 [2].

Secondary eNB: As defined in TS 36.300 [25].

Serving Cell: As defined in TS 36.331 [2].

Secondary Cell Group: As defined in TS 36.331 [2].

Secondary Timing Advance Group: As defined in TS 36.331 [2].

Synchronous Dual Connectivity: As defined in TS 36.331 [2].

TDD-FDD carrier aggregation: Carrier aggregation of component carriers in E-UTRA TDD and E-UTRA FDD operating bands TS 36.104 [30].

Timing Advance Group: As defined in TS 36.331 [2].

UE category M1 applicability: In this version of this specification the requirements for UE category M1 are derived assuming: DL Category M1 and Uplink Category M1, operation in any LTE system bandwidth but with a channel bandwidth of 1.4 MHz and transmission bandwidth of 6 PRBs in downlink and uplink, and a single antenna receiver. DL UE category M1 and UL UE category M1 are defined in [31],

WLAN RSSI: As defined in TS36.214 [4].

x_RA: x-to-RS EPRE ratio for the channel or physical signal x in all transmitted OFDM symbols not containing RS.

x_RB: x-to-RS EPRE ratio for the channel or physical signal x in all transmitted OFDM symbols containing RS.

3.2 Symbols

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

[] Values included in square blacket must be considered for futfler studies, because it means that a	[]	Values included in square bracket must be considered for further studies, because it means that a
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decision about that value was not taken.

 $BW_{Channel} \hspace{1.5cm} Channel \hspace{0.1cm} bandwidth, \hspace{0.1cm} defined \hspace{0.1cm} in \hspace{0.1cm} TS \hspace{0.1cm} 36.101 \hspace{0.1cm} subclause \hspace{0.1cm} 3.2 \hspace{0.1cm}$

CPICH_Ec Average energy per PN chip for the CPICH

CPICH_Ec/Io The ratio of the received energy per PN chip for the CPICH to the total received power spectral

density at the UE antenna connector.

Ec Average energy per PN chip.

Ês Received energy per RE (power normalized to the subcarrier spacing) during the useful part of the

symbol, i.e. excluding the cyclic prefix, at the UE antenna connector

Io The total received power density, including signal and interference, as measured at the UE antenna

connector.

Ioc The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized

to the chip rate) of a band limited noise source (simulating interference from cells, which are not

defined in a test procedure) as measured at the UE antenna connector.

Iot The received power spectral density of the total noise and interference for a certain RE (power

integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna

connector

 N_{oc} The power spectral density of a white noise source (average power per RE normalised to the

subcarrier spacing), simulating interference from cells that are not defined in a test procedure, as

measured at the UE antenna connector

 N_{PRS} Number of consecutive downlink positioning subframes as defined in clause 6.10.4.3 in TS 36.211

 n_{PRR} Physical Resource Block number as defined in clause 3.1 in TS 36.211.

 $N_{\rm TA}$ Timing offset between uplink and downlink radio frames at the UE, as defined in clause 3.1 in TS

36.211.

 $N_{\rm TA \, offset}$ Fixed timing advance offset, as defined in clause 3.1 in TS 36.211.

 P_{CMAX} Configured UE transmitted power as defined in clause 6.2.5 in TS 36.101.

 $P_{\text{CMAX},c}$ Configured UE transmitted power on a serving cell c as defined in clause 6.2.5A in TS 36.101. PRP Received (linear) average power of the resource elements that carry E-UTRA PRS, measured at

the UE antenna connector.

S Cell Selection Criterion defined in TS 36.304, subclause 5.2.3.2 for E-UTRAN

SCH_Ec/Ior The ratio of the transmit energy per PN chip of the SCH to the total transmit power spectral

density at the UTRA Node B antenna connector

SCH_RP Received (linear) average power of the resource elements that carry E-UTRA synchronisation

signal, measured at the UE antenna connector

Srxlev Cell selection RX level, defined in TS 36.304, subclause 5.2.3.2 Squal Cell selection quality, defined in TS 36.304, subclause 5.2.3.2

Sintersearch Defined in TS 25.304, subclause 5.2.6.1.5

Sintrasearch Defined in TS 25.304, subclause 5.2.6.1.5 for UTRAN and in TS 36.304, subclause 5.2.4.7 for E-

UTRAN

 T_{PRS} Cell-specific positioning subframe configuration period as defined in clause 6.10.4.3 in TS 36.211

 $T_{\text{RE-ESTABLISH-REQ}}$ The RRC Re-establishment delay requirement, the time between the moment when erroneous

CRCs are applied, to when the UE starts to send preambles on the PRACH.

 $\begin{array}{ll} Treselection & Defined in TS \ 25.304, subclause \ 5.2.6.1.5 \\ Treselection_{RAT} & Defined in TS \ 36.304 \ , subclause \ 5.2.4.7 \\ Treselection_{UTRA} & Defined in TS \ 36.304 \ , subclause \ 5.2.4.7 \\ Treselection_{UTRA} & Defined in TS \ 36.304 \ , subclause \ 5.2.4.7 \\ Treselection_{GERA} & Defined in TS \ 36.304 \ , subclause \ 5.2.4.7 \\ T_S & Basic time unit, defined in TS \ 36.211, clause \ 4 \\ \end{array}$

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [26] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [26].

1x RTT CDMA2000 1x Radio Transmission Technology

ABS Almost Blank Subframe ARQ Automatic Repeat Request

AP Access Point

AWGN Additive White Gaussian Noise BCCH Broadcast Control Channel

BCH Broadcast Channel
CA Carrier Aggregation
CC Component Carrier

CCCH SDU Common Control Channel SDU

CE Coverage Enhancement
CGI Cell Global Identifier
CPICH Common Pilot Channel

CPICH Ec/No CPICH Received energy per chip divided by the power density in the band

CRS Cell-specific Reference Signals

C-RNTI Cell RNTI

CSI Channel-State Information
CSI-RS CSI Reference Signal
DC Dual Connectivity

DCCH Dedicated Control Channel

DL Downlink

DMTC Discovery signal Measurement Timing Configuration

DRX Discontinuous Reception
DTCH Dedicated Traffic Channel
DUT Device Under Test

E-CID Enhanced Cell-ID (positioning method)

ECGI Evolved CGI

eDRX_IDLE Extended IDLE-mode DRX

eDRX_CONN Extended CONNECTED-mode DRX

eNB E-UTRAN NodeB

E-SMLC Enhanced Serving Mobile Location Centre

E-UTRA Evolved UTRA E-UTRAN Evolved UTRAN

FDD Frequency Division Duplex

GERAN GSM EDGE Radio Access Network
GSM Global System for Mobile communication

HARQ Hybrid Automatic Repeat Request

HD-FDD Half-Duplex FDD

HO Handover

HRPD High Rate Packet Data IDC In-Device Coexistence

IEEE Institute of Electrical and Electronics Engineers

LPP LTE Positioning Protocol
LWA LTE-WLAN Aggregation
MAC Medium Access Control
MCG Master Cell Group
MeNB Master eNB

MBSFN Multimedia Broadcast multicast service Single Frequency Network

MBSFN ABS MBSFN Almost Blank Subframe
MDT Minimization of Drive Tests
MGRP Measurement Gap Repetition Period

MIB Master Information Block

OCNG OFDMA Channel Noise Generator

OFDM Orthogonal Frequency Division Multiplexing

OFDMA Orthogonal Frequency Division Multiplexing
OFDMA Orthogonal Frequency Division Multiple Access

OTDOA Observed Time Difference of Arrival

PBCH Physical Broadcast Channel

P-CCPCH Primary Common Control Physical Channel

PCell Primary Cell

PCFICH Physical Control Format Indicator CHannel
PDCCH Physical Downlink Control CHannel
PDSCH Physical Downlink Shared CHannel
PHICH Physical Hybrid-ARQ Indicator CHannel

PLMN Public Land Mobile Network
PMCH Physical Multicast Channel
PRACH Physical Random Access CHannel

ProSe Proximity-based Services
PRS Positioning Reference Signal

PSBCH Physical Sidelink Broadcast CHannel PSCCH Physical Sidelink Control Channel

PSCell Primary SCell

PSS Primary Synchronization SignalPSSCH Physical Sidelink Shared CHannel

psTAG Primary Secondary Timing Advance Group

pTAG Primary Timing Advance Group

PTW Paging Time Window

PUCCH Physical Uplink Control CHannel PUSCH Physical Uplink Shared Channel

RS-SINR Reference Signal Signal to Noise and Interference RatioRSCP Received Signal Code Power

RSRP Reference Signal Received Power
RSRQ Reference Signal Received Quality
RSSI Received Signal Strength Indicator
RSTD Reference Signal Time Difference
QAM Quadrature Amplitude Modulation

RACH Random Access Channel

RAT	Radio Access Technology
RNC	Radio Network Controller

RNTI Radio Network Temporary Identifier

RRC Radio Resource Control
RRM Radio Resource Management
SCE Small Cell Enhancement
SCH Synchronization Channel

SCell Secondary Cell

SCG Secondary Cell GroupSDU Service Data Unit

SeNB Secondary eNB
SFN System Frame Number
SI System Information
SIB System Information Block

SLSS SideLink Synchronization Sequence

SON Self Optimized Network
SRS Sounding Reference Signal
SSS Secondary Synchronization Signal
SSTD SFN and subframe time difference
sTAG Secondary Timing Advance Group

TAG Timing Advance Group
TDD Time Division Duplex
TP Transmission Point

TTI Transmission Time Interval

UE User Equipment

UL Uplink

UMTS Universal Mobile Telecommunication System

UTRA Universal Terrestrial Radio Access

UTRAN Universal Terrestrial Radio Access Network

WLAN Wireless Local Area Network WB-RSRQ Wide Bandwith RSRQ

3.4 Test tolerances

The requirements given in the present document make no allowance for measurement uncertainty. The test specification 36.521-3 [23] defines the test tolerances. These test tolerances are individually calculated for each test. The test tolerances are then added to the limits in this specification to create test limits. The measurement results are compared against the test limits as defined by the shared risk principle.

Shared Risk is defined in [ETR 273 Part 1 sub-part 2 clause 6.5].

3.5 Additional notation

3.5.1 Groups of bands

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

FS3_M

FS3_N

Group E-UTRA FDD E-UTRA TDD **E-UTRA Frame Structure 3** Band group Operating Band **Band group** notation notation bands group Operating bands Operating bands notation 1, 4, 6, 10, 11, 18, 19, 21, 23, 24, 32 Note 4, 67 FDD A TDD A FS3 A Α 33, 34, 35, 36, 37, 38, 39, 40, 45 65, 66 Note 5 FDD B TDD B В FS3 B FDD C 9. 30 TDD C 42, 43 FS3 C C D FDD D TDD D FS₃ D 28 Ε FDD_E 2, 5, 7, 27 TDD_E 41, 44 FS3_E Note 3 F FDD_F TDD_F FS3 F 26 G 3, 8, 12, 13, 14, 17, 20, 22, 29 Note 2 FDD_G FS3_G TDD_G 46 Н FDD_H 25 TDD_H FS3_H FDD_I TDD_I FS3_I FDD_J TDD_J FS3_J FDD_K FS3_K K TDD_K FDD_L FS3_L _ TDD_L

Table 3.5.1-1: E-UTRA band groups

TDD_N NOTE 1: The bands within the same group have the same lo conditions in a corresponding requirement in this specification.

TDD_M

NOTE 2: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.

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- NOTE 3: The minimum lo condition for Band 26 is reduced by 0.5 dB when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
- NOTE 4: Band 32 is used only for E-UTRA carrier aggregation with other E-UTRA bands.
- The 2180 2200 MHz part of Band 66 is used only for E-UTRA carrier aggregation with other E-UTRA bands.
- NOTE 6: Band 67 is used only for E-UTRA carrier aggregation with other E-UTRA bands.

3.6 General

FDD_M

FDD_N

М

3.6.1 Applicability of requirements in this specification version

- The requirements for TDD-FDD carrier aggregation are specified for two downlink and one uplink component carriers. The requirements are specified for both cases when the PCell belongs to TDD or FDD.
- All the requirements for intra-band contiguous and non-contiguous CA apply under the assumption of the same uplink-downlink and special subframe configurations [16] in the PCell and SCell.
- All the requirements for inter-band CA apply for the same uplink-downlink and special subframe configurations [16] in the PCell and SCell. Different uplink-downlink and special subframe configurations [16] in the PCell and SCell are supported for inter-band CA for UEs which:
 - do not support simultaneous reception and transmission for inter-band TDD CA specified in TS 36.331 [2], and
 - are compliant to the requirements specified in TS 36.101 for inter-band CA with uplink in one E-UTRA band and without simultaneous Rx/Tx.
- All the inter-frequency requirements and requirements for measurements on deactivated carrier apply for the same uplink-downlink and special subframe configurations [16] in the PCell and SCell. Different uplinkdownlink and special subframe configurations [16] in the PCell and SCell are supported for inter-frequency for UEs which:
 - do not support simultaneous reception and transmission for inter-band TDD CA specified in TS 36.331 [2], and are compliant to the requirements specified in TS 36.101 for inter-band CA with uplink in one E-UTRA band and without simultaneous Rx/Tx.
- Requirements for E-UTRA carrier aggregation are applicable for the CA capable UE which has been configured with at least one downlink SCell, but:

- up to four downlink CCs and up to two uplink CCs for intra-band contiguous carrier aggregation, or
- up to four downlink CCs and one uplink CCs for inter-band carrier aggregation, or
- up to two downlink/uplink CCs intra-band contiguous and one downlink/uplink inter-band carrier aggregation, or
- up to two downlink CCs intra-band contiguous and one downlink inter-band and up to two uplink CCs for inter-band carrier aggregation, or
- up to two downlink CCs intra-band non-contiguous and one downlink inter-band and up to two uplink CCs for inter-band carrier aggregation, or
- up to three downlink CCs intra-band contiguous and one downlink intra-band non-contiguous and up to two uplink CCs intra-band contiguous for carrier aggregation, or
- two sub-blocks intra-band non-contiguous with two downlink CCs intra-band contiguous per sub-blocks and up to two uplink CCs intra-band contiguous for carrier aggregation, or
- two downlink CCs intra-band contiguous and three down link CCs inter-band and one uplink CC for carrier aggregation, or
- two downlink CCs intra-band contiguous and two downlink CCs intra-band contiguous and one downlink CC inter-band and one uplink CC for carrier aggregation, or
- up to two downlink CCs and up to two uplink CCs for intra-band non-contiguous carrier aggregation, or
- up to two downlink CCs and up to two uplink CCs for inter-band carrier aggregation, or
- up to two downlink CCs intra-band contiguous and one downlink inter-band and one uplink CC for carrier aggregation, or
- up to two downlink CCs intra-band non-contiguous and one downlink inter-band and one uplink CC for carrier aggregation, or
- up to two downlink CCs and one uplink CC for intra-band non-contiguous carrier aggregation.
- Requirements for E-UTRA carrier aggregation for discovery signal measurements are applicable for CA capable UE which has been configured with at least one downlink SCell, but:
 - up to four downlink CCs and up to two uplink CCs for intra-band contiguous carrier aggregation, or
 - up to four downlink CCs and up to one uplink CCs for inter-band carrier aggregation, or
 - up to two downlink/uplink CCs intra-band contiguous and one downlink/uplink inter-band carrier aggregation, or
 - up to two downlink CCs intra-band contiguous and one downlink inter-band and up to two uplink CCs for inter-band carrier aggregation, or
 - up to two downlink CCs intra-band non-contiguous and one downlink inter-band and up to two uplink CCs for inter-band carrier aggregation, or
 - up to three downlink CCs intra-band contiguous and one downlink intra-band non-contiguous and up to two uplink CCs intra-band contiguous for carrier aggregation, or
 - two sub-blocks intra-band non-contiguous with two downlink CCs intra-band contiguous per sub-blocks and up to two uplink CCs intra-band contiguous for carrier aggregation, or
 - two downlink CCs intra-band contiguous and three down link CCs inter-band and one uplink CC for carrier aggregation, or
 - two downlink CCs intra-band contiguous and two downlink CCs intra-band contiguous and one downlink CC inter-band and one uplink CC for carrier aggregation, or
 - up to two downlink CCs and up to two uplink CCs for intra-band non-contiguous carrier aggregation, or

- up to two downlink CCs and up to two uplink CCs for inter-band carrier aggregation, or
- up to two downlink CCs intra-band contiguous and one downlink inter-band and one uplink CC for carrier aggregation, or
- up to two downlink CCs intra-band non-contiguous and one downlink inter-band and one uplink CC for carrier aggregation, or
- up to two downlink CCs and one uplink CC for intra-band non-contiguous carrier aggregation.
- Requirements for E-UTRA carrier aggregation, where the PCell is FDD PCell or TDD PCell and the downlink SCell(s) follow the frame structure type 3 [16], are applicable for the CA capable UE, which is supporting band combinations according to 36.101 [5] and which has been configured with at least one downlink SCell but:
 - up to five downlink CCs and one uplink CCs for inter-band carrier aggregation.
- The requirements for UE configured with eDRX_CONN cycle do not apply for CA requirements and dual connectivity requirements.
- The requirements for a UE category 0 are derived assuming UE category 0 [31] and a single antenna receiver.
- Requirements for E-UTRA ProSe Direct Discovery and E-UTRA ProSe Direct Communication are applicable for ProSe operation on either the uplink frequency of PCC, or SCC, or a non-serving carrier, but:
 - with ProSe operation limited to one carrier on a given subframe.

4 E-UTRAN RRC_IDLE state mobility

4.1 Cell Selection

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in TS36.304. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

4.2 Cell Re-selection

4.2.1 Introduction

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in either *Camped Normally* state or *Camped on Any Cell* state on a cell, the UE shall attempt to detect, synchronise, and monitor intra-frequency, inter-frequency and inter-RAT cells indicated by the serving cell. For intra-frequency and inter-frequency cells the serving cell may not provide explicit neighbour list but carrier frequency information and bandwidth information only. UE measurement activity is also controlled by measurement rules defined in TS36.304, allowing the UE to limit its measurement activity.

If the UE is of category M1 and in normal coverage, it shall attempt to detect, synchronise, and monitor intra-frequency cells indicated by the serving cell according to the requirements in section 4.2.2, except that UE is not required to perform RSRQ measurement. The UE category M1 and normal coverage applicability of the requirements is defined in Section 3.1.

If the UE is in enhanced coverage as defined in section 3.1, the requirements in section 4.2.2.11 apply.

4.2.2 Requirements

The UE shall search every layer of higher priority at least every $T_{higher_priority_search} = (60 * N_{layers})$ seconds when the UE is not configured with eDRX_IDLE cycle, and at least every $T_{higher_priority_search} = MAX(60 * N_{layers})$, one eDRX_IDLE

cycle) when UE is configured with eDRX_IDLE cycle, where N_{layers} is the total number of configured higher priority E-UTRA, UTRA FDD, UTRA TDD, CDMA2000 1x and HRPD carrier frequencies and is additionally increased by one if one or more groups of GSM frequencies is configured as a higher priority.

In the requirements of Section 4.2.2 for the UE capable of CA, the applicable exceptions for side conditions are specified in Annex B, Section B.4.2.

For a UE which supports increased carrier monitoring E-UTRA or increased carrier monitoring UTRA, the reselection performance for different carriers may be configured by higher layers to be either normal or reduced. The following definitions are used in the requirements:

 K_{carrier} : Total number of interfrequency carriers in the neighbour cell list

 $K_{carrier,normal} = K_{carrier} - K_{carrier,reduced}$: Number of interfrequency carriers to be monitored in the normal performance group

K_{carrier,normal,FDD}: Number of interfrequency FDD carriers to be monitored in the normal performance group

K_{carrier,normal,TDD}: Number of interfrequency TDD carriers to be monitored in the normal performance group

K_{carrier,reduced}: Number of interfrequency carriers to be monitored in the reduced performance group

 $N_{UTRA_carrier}$: Total number of configured UTRA FDD carriers in the neighbour cell list

 $N_{UTRA_carrier,normal} = N_{UTRA_carrier} - N_{UTRA_carrier,reduced}$: Number of UTRA FDD carriers to be monitored in the normal performance group

 $N_{UTRA\ carrier,reduced}$: Number of UTRA FDD carriers to be monitored in the reduced performance group

 $N_{UTRA_carrier_TDD}$: Total number of configured UTRA TDD carriers in the neighbour cell list

 $N_{UTRA_carrier_TDD,normal} = N_{UTRA_carrier_TDD} - N_{UTRA_carrier_TDD,reduced} : Number of UTRA \ TDD \ carriers \ to \ be \ monitored \ in the normal performance grop$

 $N_{UTRA_carrier_TDD,reduced}$: Number of UTRA TDD carriers to be monitored in the reduced performance group

The minimum performance requirements for a UE which supports Increased UE carrier monitoring E-UTRA [2, 31] are calculated as defined in section 4.2.2.4 provided that $K_{carrier,normal} \le 3$ for a UE capable of either FDD E-UTRA carrier monitoring or TDD E-UTRA carrier monitoring or K_{carrier,normal} ≤ 6 for a UE capable of both FDD and TDD E-UTRA carrier monitoring provided $K_{\text{carrier,normal,FDD}} \le 3$ and $K_{\text{carrier,normal,TDD}} \le 3$ and the minimum performance requirements for a UE which supports Increased UE carrier monitoring UTRA [2, 31] are calculated as defined in section 4.2.2.5 provided that $N_{UTRA_carrier_normal} \le 3$ and $N_{UTRA_carrier_TDD,normal} \le 3$. In case the limits for the number of normal performance carriers is exceeded considering the broadcast neighbour cell list and the bands supported by the UE, the UE which supports Increased UE carrier monitoring E-UTRA shall measure at least 3 interfrequency carriers with normal performance and the UE which supports Increased UE carrier monitoring UTRA shall measure at least 3 UTRA carriers with normal performance. For a UE capable of monitoring E-UTRAN FDD and TDD carriers, in case the limits for the number of normal performance carriers is exceeded considering the broadcast neighbour cell list and the bands supported by the UE, the UE shall measure at least 3 FDD and 3 TDD E-UTRAN interfrequency carriers with normal performance. Additionally, reduced performance requirements shall be met for carriers for which the Reduced measurement performance IE is indicated, up to the UE measurement capability in section 4.2.2.9a. The minimum performance requirements for a UE which does not support Increased UE carrier monitoring E-UTRA [2,31] are calculated assuming all E-UTRA carriers required to be monitored for such UE, are having normal performance and are in normal performance group, i.e. $K_{carrier,normal} = K_{carrier}$ and $K_{carrier,reduced} = 0$. The minimum performance requirements for a UE which does not support Increased UE carrier monitoring UTRA [2,31] are calculated assuming all UTRA carriers required to be monitored for such UE, are having normal performance and are in normal performance group, i.e. N_{UTRA_carrier,normal}= $N_{UTRA_carrier}, N_{UTRA_carrier_TDD, normal} = N_{UTRA_carrier_TDD} \ \ and \ N_{UTRA_carrier, reduced} = 0 \ and \ N_{UTRA_carrier_TDD, reduced} = 0. \ No \ reduced$ performance carrier requirement applies to a UE not supporting Increased UE carrier monitoring E-UTRA or UTRA [2, 31]. Capabilities for number of carriers to monitor for a UE which does not support Increased carrier monitoring E-UTRA or Increased carrier monitoring UTRA are specified in section 4.2.2.9

4.2.2.1 Measurement and evaluation of serving cell

The UE shall measure the RSRP and RSRQ level of the serving cell and evaluate the cell selection criterion S defined in [1] for the serving cell at least every DRX cycle.

The UE shall filter the RSRP and RSRQ measurements of the serving cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by, at least DRX cycle/2.

If the UE is not configured with eDRX_IDLE cycle and has evaluated according to Table 4.2.2.1-1 in N_{serv} consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated by the serving cell, regardless of the measurement rules currently limiting UE measurement activities. If the UE is configured with eDRX_IDLE cycle and has evaluated according to Table 4.2.2.1-2 in N_{serv} consecutive DRX cycles within a single PTW that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated by the serving cell, regardless of the measurement rules currently limiting UE measurement activities.

If the UE in RRC_IDLE has not found any new suitable cell based on searches and measurements using the intra-frequency, inter-frequency and inter-RAT information indicated in the system information during the time T, the UE shall initiate cell selection procedures for the selected PLMN as defined in [1], where T=10 s if the UE is not configured with eDRX_IDLE cycle, and T=MAX(10 s, one eDRX_IDLE cycle) if the UE is configured with eDRX_IDLE cycle.

Table 4.2.2.1-1: N_{serv}

Table 4.2.2.1-2: N_{serv} for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s]	N _{serv} [number of DRX cycles]
	0.32	≥1	2
5.12 ≤ eDRX_IDLE cycle	0.64	≥2	2
length ≤ 2621.44	1.28	≥3	2
	2.56	≥6	2

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.

NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX_IDLE, being configured with eDRX_IDLE cycle, changing eDRX_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE has to meet the requirement corresponding to the second state.

4.2.2.2 Void

4.2.2.3 Measurements of intra-frequency E-UTRAN cells

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

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS36.304 within $T_{\text{detect}, \text{EUTRAN_Intra}}$ when that Treselection= 0. An intra frequency cell is considered to be detectable according to RSRP, RSRP £s/Iot, SCH_RP and SCH £s/Iot defined in Annex B.1.1 for a corresponding Band.

The UE shall measure RSRP and RSRQ at least every $T_{measure,EUTRAN_Intra}$ for intra-frequency cells that are identified and measured according to the measurement rules.

2.56

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

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

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined [1] within $T_{evaluate,E-UTRAN_intra}$ when $T_{reselection} = 0$, provided that the cell is at least 3dB better ranked. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and non-serving intra-frequency cells.

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

For UE not configured with eDRX_IDLE cycle, $T_{detect,EUTRAN_Intra}$, $T_{measure,EUTRAN_Intra}$ and $T_{evaluate, E-UTRAN_intra}$ are specified in Table 4.2.2.3-1. For UE configured with eDRX_IDLE cycle, $T_{detect,EUTRAN_Intra}$, $T_{measure,EUTRAN_Intra}$ and $T_{evaluate, E-UTRAN_intra}$ are specified in Table 4.2.2.3-2, where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{detect,EUTRAN_Intra}$, $T_{measure,EUTRAN_Intra}$ and $T_{evaluate,E-UTRAN_intra}$ when multiple PTWs are used.

DRX cycle length [s]	T _{detect,EUTRAN_Intra} [s] (number of DRX cycles)	T _{measure,EUTRAN_Intra} [s] (number of DRX cycles)	T _{evaluate,E-UTRAN_intra} [s] (number of DRX cycles)
0.32	11.52 (36)	1.28 (4)	5.12 (16)
0.64	17.92 (28)	1.28 (2)	5.12 (8)
1.28	32(25)	1.28 (1)	6.4 (5)

Table 4.2.2.3-1: T_{detect,EUTRAN_Intra}, T_{measure,EUTRAN_Intra} and T_{evaluate, E-UTRAN_intra}

Table 4.2.2.3-2: T_{detect,EUTRAN_Intra}, T_{measure,EUTRAN_Intra} and T_{evaluate,E-UTRAN_intra} for UE configured with eDRX IDLE cycle

2.56(1)

7.68(3)

, ,			dottoti,Eoritzia E-1 (T _{measure,EUTRAN_Intra} [s] (number of DRX cycles)	T _{evaluate,E-UTRAN_intra} [s] (number of DRX cycles)
5.12 ≤	0.32	≥1	[23]	0.32 (1)	0.64 (2)
eDRX_IDLE	0.64	≥2	$eDRX _cycle_length \times $	0.64 (1)	1.28 (2)
cycle length	1.28	≥3	$eDRX _cycle _length \times \left \frac{23}{\left\lceil PTW / DRX _cycle _length \right\rceil} \right $	1.28 (1)	2.56 (2)
≤ 2621.44	2.56	≥6	(23)	2.56 (1)	5.12 (2)

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs. NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].

58.88 (23)

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX_IDLE, being configured with eDRX_IDLE cycle, changing eDRX_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE has to meet the requirement corresponding to the second state.

4.2.2.4 Measurements of inter-frequency E-UTRAN cells

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

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

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

If the UE is not configured with eDRX_IDLE cycle or configured with an eDRX_IDLE cycle not longer than 20.48 s, the UE shall be able to evaluate whether a newly detectable inter-frequency cell in normal performance group meets the reselection criteria defined in TS36.304 within $K_{carrier,normal} * T_{detect,EUTRAN_Inter}$, and able to evaluate whether a newly detectable inter-frequency cell in reduced performance group meets the reselection criteria defined in TS36.304 within 6 * K_{carrier,reduced} * T_{detect,EUTRAN_Inter} if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when T_{reselection} = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, the UE shall be able to evaluate whether a newly detectable inter-frequency cell in normal performance group meets the reselection criteria $defined \ in \ TS36.304 \ within \ K_{carrier,normal} * T_{detect,EUTRAN_Inter}, \ and \ when \ Srxlev < 3 \ dB \ or \ Squal < 3 \ dB \ able \ to \ evaluate$ whether a newly detectable inter-frequency cell in reduced performance group meets the reselection criteria defined in $TS36.304 \ within \ 6*K_{carrier,reduced}*T_{detect,EUTRAN_Inter}\ if\ at\ least\ carrier\ frequency\ information\ is\ provided\ for\ inter-provided\ for\$ frequency neighbour cells by the serving cells when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. An inter-frequency cell is considered to be detectable according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot defined in Annex B.1.2 for a corresponding Band.

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

If the UE is configured with eDRX_IDLE cycle not longer than 20.48 s, the UE shall measure RSRP or RSRQ at least every $K_{carrier,normal} * T_{measure,EUTRAN_Inter}$ for identified lower or equal priority inter-frequency cells in normal performance group, and at least every $6 * K_{carrier,reduced} * T_{measure,EUTRAN_Inter}$ for identified lower or equal priority inter-frequency cells in reduced performance group. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, the UE shall measure RSRP or RSRQ at least every $K_{carrier,normal} * T_{measure,EUTRAN_Inter}$ for identified lower or equal priority inter-frequency cells in normal performance group, and when Srxlev < 3 dB or Squal < 3 dB at least every $6 * K_{carrier,reduced} * T_{measure,EUTRAN_Inter}$ for identified lower or equal priority inter-frequency cells in reduced performance group. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

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

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

If the UE is configured with eDRX_IDLE cycle not longer than 20.48 s, for an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell in normal performance group has met reselection criterion defined TS 36.304 within $K_{\text{carrier,normal}} * T_{\text{evaluate,E-UTRAN_Inter}}$, and capable of evaluating that the inter-frequency cell in reduced performance group has met reselection criterion defined TS 36.304 within $6 * K_{carrier,reduced} * T_{evaluate,E-UTRAN_Inter}$, when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, for an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the interfrequency cell in normal performance group has met reselection criterion defined TS 36.304 within K_{carrier,normal} * T_{evaluate,E-UTRAN Inter}, and when Srxlev < 3 dB or Squal < 3 dB capable of evaluating that the inter-frequency cell in reduced performance group has met reselection criterion defined TS 36.304 within 6 * K_{carrier,reduced} * T_{evaluate,E-UTRAN_Inter}, when T_{reselection} = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and interfrequency cells.

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

For UE not configured with eDRX_IDLE cycle, $T_{detect,EUTRAN_Inter}$, $T_{measure,EUTRAN_Inter}$ and $T_{evaluate, E-UTRAN_inter}$ are specified in Table 4.2.2.4-1. For UE configured with eDRX_IDLE cycle, $T_{detect,EUTRAN_Inter}$, $T_{measure,EUTRAN_inter}$ and $T_{evaluate, E-UTRAN_inter}$ are specified in Table 4.2.2.4-2, where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{detect,EUTRAN_Inter}$, $T_{measure,EUTRAN_Inter}$ and $T_{evaluate,E-UTRAN_inter}$ when multiple PTWs are used.

DRX cycle length [s]	T _{detect,EUTRAN_Inter} [s] (number of DRX cycles)	T _{measure,EUTRAN_Inter} [s] (number of DRX cycles)	T _{evaluate,E} . UTRAN_Inter [s] (number of DRX cycles)
0.32	11.52 (36)	1.28 (4)	5.12 (16)
0.64	17.92 (28)	1.28 (2)	5.12 (8)
1.28	32(25)	1.28 (1)	6.4 (5)
2.56	58 88 (23)	2.56 (1)	7 68 (3)

Table 4.2.2.4-1: T_{detect,EUTRAN Inter}, T_{measure,EUTRAN Inter} and T_{evaluate,E-UTRAN Inter}

Table 4.2.2.4-2: T_{detect,EUTRAN_Inter}, T_{measure,EUTRAN_Inter} and T_{evaluate, E-UTRAN_inter} for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s]	T _{detect,EUTRAN_Inter} [s] (number of DRX cycles)	T _{measure,EUTRAN_Inter} [s] (number of DRX cycles)	T _{evaluate,E-UTRAN_inter} [s] (number of DRX cycles)
5.12 ≤	0.32	≥1	23	0.32 (1)	0.64 (2)
eDRX_IDLE	0.64	≥2	aDRY cycle langthy	0.64 (1)	1.28 (2)
cycle length	1.28	≥3	PTW / DRX _cycle _length	1.28 (1)	2.56 (2)
≤ 2621.44	2.56	≥6	(23)	2.56 (1)	5.12 (2)

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs. NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].

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

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX_IDLE, being configured with eDRX_IDLE cycle, changing eDRX_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE has to meet the requirement corresponding to the second state.

4.2.2.5 Measurements of inter-RAT cells

If $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is described in clause 4.2.2

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

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX_IDLE, being configured with eDRX_IDLE cycle, changing eDRX_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE has to meet the requirement corresponding to the second state.

4.2.2.5.1 Measurements of UTRAN FDD cells

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate specified in this section. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, the UE shall evaluate whether newly detectable UTRA FDD cells in normal performance group have met the reselection criteria in TS 36.304 within time $N_{UTRA_carrier,normal}$ * $T_{detectUTRA_FDD}$, and evaluate whether newly detectable UTRA FDD cells in reduced performance group have met the reselection criteria in TS 36.304 within time 6 * $N_{UTRA_carrier,reduced}$ * $T_{detectUTRA_FDD}$ when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$ when $Treselection_{RAT} = 0$ provided that the reselections based on Ec/Io. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, the UE shall evaluate whether newly detectable UTRA FDD cells in normal performance group have met the reselection criteria in TS 36.304 within time ($N_{UTRA_carrier,normal}$) * $T_{detectUTRA_FDD}$, and when Srxlev < 3 dB or Squal < 3 dB evaluate whether newly detectable UTRA FDD cells in reduced performance group have met the reselection criteria in TS 36.304 within time 6 * $N_{UTRA_carrier,reduced}$ * $T_{detectUTRA_FDD}$ when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$ when $Treselection_{RAT} = 0$ provided that the reselection criteria is met by a margin of at least 6dB for reselections based on RSCP, or a margin of at least 3dB for reselections based on Ec/Io.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, cells which have been detected shall be measured at least every $N_{UTRA_carrier,normal} * T_{measureUTRA_FDD}$ for the cells in normal performance group, and at least every $6 * N_{UTRA_carrier,reduced} * T_{measureUTRA_FDD}$ for the cells in reduced performance group when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, cells which have been detected shall be measured at least every $(N_{UTRA_carrier,normal}) * T_{measureUTRA_FDD}$ for the cells in normal performance group, and when Srxlev < 3 dB or Squal < 3 dB at least every $6 * N_{UTRA_carrier,reduced} * T_{measureUTRA_FDD}$ for the cells in reduced performance group when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchP}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA_FDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, for a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met reselection criterion defined in TS 36.304 [1] within $N_{\rm UTRA_carrier,normal}$ * $T_{\rm evaluateUTRA_FDD}$ if the cell is in normal performance group and within 6 * $N_{\rm UTRA_carrier,reduced}$ * $T_{\rm evaluateUTRA_FDD}$ if the cell is in reduced performance group when $T_{\rm reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6dB for reselections based on RSCP, or a margin of at least 3dB for reselections based on Ec/Io. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, for a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met reselection criterion defined in TS 36.304 [1] within ($N_{\rm UTRA_carrier,normal}$) * $T_{\rm evaluateUTRA_FDD}$ if the cell is in normal performance group and when Srxlev < 3 dB or Squal < 3 dB within 6 * $N_{\rm UTRA_carrier,reduced}$ * $T_{\rm evaluateUTRA_FDD}$ if the cell is in reduced performance group when $T_{\rm reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6dB for reselections based on RSCP, or a margin of at least 3dB for reselections based on Ec/Io.

If $T_{reselection}$ timer has a non zero value and the UTRA FDD cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this UTRA FDD cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{detectUTRA_FDD}$, $T_{measureUTRA_FDD}$ and $T_{evaluateUTRA_FDD}$ are specified in Table 4.2.2.5.1-1. For UE configured with eDRX_IDLE cycle, $T_{detectUTRA_FDD}$, $T_{measureUTRA_FDD}$ and $T_{evaluateUTRA_FDD}$ are specified in Table 4.2.2.5.1-2, where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{detectUTRA_FDD}$, $T_{measureUTRA_FDD}$ and $T_{evaluateUTRA_FDD}$ when multiple PTWs are used.

DRX cycle length [s]	T _{detectUTRA_FDD} [s]	T _{measureUTRA_FDD} [s] (number of DRX cycles)	T _{evaluateUTRA_FDD} [s] (number of DRX cycles)
0.32		5.12 (16)	15.36 (48)
0.64	30	5.12 (8)	15.36 (24)
1.28		6.4(5)	19.2 (15)
2.56	60	7.68 (3)	23.04 (9)

Table 4.2.2.5.1-1: T_{detectUTRA_FDD}, T_{measureUTRA_FDD}, and T_{evaluateUTRA_FDD}

Table 4.2.2.5.1-2: T_{detectUTRA_FDD}, T_{measureUTRA_FDD} and T_{evaluateUTRA_FDD} for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s]	T _{detectUTRA_FDD} [s] (number of DRX cycles)	T _{measureUTRA_FDD} [s] (number of DRX cycles)	T _{evaluateUTRA_FDD} [s] (number of DRX cycles)
5.12 ≤	0.32	≥1	Note 3 (23)	0.96 (3)	Note 3 (9)
eDRX_IDLE	0.64	≥2		1.92 (3)	Note 3 (9)
cycle length ≤	1.28	≥4		3.84 (3)	Note 3 (9)
2621.44	2.56	≥8		7.68 (3)	Note 3 (9)

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.

NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].

NOTE 3: The time is calculated depending on the number N of DRX cycles as follows:

$$eDRX _cycle _length \times \left[\frac{N}{ \left\lceil PTW / DRX _cycle _length \right\rceil} \right]$$

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

4.2.2.5.2 Measurements of UTRAN TDD cells

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate specified in this section. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period. If the UE is not configured with eDRX_IDLE cycle, P-CCPCH RSCP of UTRAN TDD cells shall not be filtered over a longer period than that specified in table 4.2.2.5.2-1. If the UE is configured with eDRX_IDLE cycle, P-CCPCH RSCP of UTRAN TDD cells shall not be filtered over a longer period than that specified in table 4.2.2.5.2-2.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, the UE shall evaluate whether newly detectable UTRA TDD cells in normal performance group have met the reselection criteria in TS 36.304 within time $N_{UTRA_carrier_TDD,normal} * T_{detectUTRA_TDD}$, and evaluate whether newly detectable UTRA TDD cells in reduced performance group have met the reselection criteria in TS 36.304 within time 6 * $N_{UTRA_carrier_TDD,reduced} * T_{detectUTRA_TDD}$ when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$ when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6dB. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, the UE shall evaluate whether newly detectable UTRA TDD cells in normal performance group have met the reselection criteria in TS 36.304 within time ($N_{UTRA_carrier_TDD,normal}$) * $T_{detectUTRA_TDD}$, and when Srxlev < 3 dB or Squal < 3 dB evaluate whether newly detectable UTRA TDD cells in reduced performance group have met the reselection criteria in TS 36.304 within time 6 * $N_{UTRA_carrier_TDD,reduced}$ * $T_{detectUTRA_TDD}$ when $Srxlev \le S_{nonIntraSearchP}$ or $Squal \le S_{nonIntraSearchP}$ when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6dB.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, cells which have been detected shall be measured at least every $N_{UTRA_carrier_TDD,normal} * T_{measureUTRA_TDD}$ for the cells in normal performance group, and at least every $6 * N_{UTRA_carrier_TDD,reduced} * T_{measureUTRA_TDD}$ for the cells in reduced performance group, when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, cells which have been detected shall be measured at least every $(N_{UTRA_carrier_TDD,normal}) * T_{measureUTRA_TDD}$ for the cells in normal performance group, and when Srxlev < 3 dB or Squal < 3 dB at least every $6 * N_{UTRA_carrier_TDD,reduced} * T_{measureUTRA_TDD}$ for the cells in reduced performance group, when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchO}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA_TDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell.

If the UE is not configured with eDRX_IDLE cycle or configured with eDRX_IDLE cycle not longer than 20.48 s, for a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met reselection criterion defined in [1] within $N_{\text{UTRA_carrier_TDD,normal}}$ * $T_{\text{evaluateUTRA_TDD}}$ if the cell is in normal performance group and within 6 * $N_{\text{UTRA_carrier_TDD,reduced}}$ * $T_{\text{evaluateUTRA_TDD}}$ if the cell is in reduced performance group when $T_{\text{reselection}} = 0$ provided that the reselection criteria is met by a margin of at least 6dB. If the UE is configured with eDRX_IDLE cycle longer than 20.48 s, for a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met reselection criterion defined in [1] within $N_{\text{UTRA_carrier_TDD,normal}}$ * $T_{\text{evaluateUTRA_TDD}}$ if the cell is in normal performance group and when $S_{\text{TNLev}} < 3$ dB or $S_{\text{qual}} < 3$ dB within 6 * $N_{\text{UTRA_carrier_TDD,reduced}}$ * $T_{\text{evaluateUTRA_TDD}}$ if the cell is in reduced performance group when $T_{\text{reselection}} = 0$ provided that the reselection criteria is met by a margin of at least 6dB.

If $T_{reselection}$ timer has a non zero value and the UTRA TDD cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this UTRA TDD cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{detectUTRA_TDD}$, $T_{measureUTRA_TDD}$ and $T_{evaluateUTRA_TDD}$ are specified in Table 4.2.2.5.2-1. For UE configured with eDRX_IDLE cycle, $T_{detectUTRA_TDD}$, $T_{measureUTRA_TDD}$ and $T_{evaluateUTRA_TDD}$ are specified in Table 4.2.2.5.2-2, where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{detectUTRA_TDD}$, $T_{measureUTRA_TDD}$ and $T_{evaluateUTRA_TDD}$ when multiple PTWs are used.

DRX T_{detectUTRA TDD} TmeasureUTRA TDD TevaluateUTRA TDD cycle [s] [s] (number of [s] (number of length DRX cycles) DRX cycles) [s] 5.12 (16) 15.36 (48) 0.32 0.64 5.12 (8) 15.36 (24) 30 1.28 6.4(5) 19.2 (15) 2.56 60 7.68 (3) 23.04 (9)

Table 4.2.2.5.2-1: $T_{detectUTRA_TDD}$, $T_{measureUTRA_TDD}$ and $T_{evaluateUTRA_TDD}$

Table 4.2.2.5.2-2: T_{detectUTRA_TDD}, T_{measureUTRA_TDD} and T_{evaluateUTRA_TDD} for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s]		T _{measureUTRA_TDD} [s] (number of DRX cycles)	
5.12 ≤	0.32	≥1	Note 3 (23)	0.96 (3)	Note 3 (9)
eDRX_IDLE	0.64	≥2		1.92 (3)	Note 3 (9)
cycle length ≤	1.28	≥4		3.84 (3)	Note 3 (9)
2621.44	2.56	≥8		7.68 (3)	Note 3 (9)

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.

NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].

NOTE 3: The time is calculated depending on the number N of DRX cycles as follows:

$$eDRX _cycle_length \times \boxed{ N \over \lceil PTW / DRX _cycle_length \rceil}$$

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

4.2.2.5.3 Measurements of GSM cells

When the measurement rules defined in [1] indicate that E-UTRAN inter-frequencies or inter-RAT frequency cells are to be measured, the UE shall measure the signal level of the GSM BCCH carriers if the GSM BCCH carriers are indicated in the measurement control system information of the serving cell. GSM BCCH carriers of lower priority than the serving cell shall be measured at least every T_{measure,GSM}.

When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{\text{measure},GSM}$, and the UE shall decode the BSIC of the GSM BCCH carrier. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection, or to continuously verify the BSIC of the GSM BCCH carrier every 30s. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell.

The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If continuous GSM measurements are required by the measurement rules in [1], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell.

The UE shall not consider the GSM BCCH carrier in cell reselection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

If $T_{reselection}$ timer has a non zero value and the GSM cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this GSM cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

For UE not configured with eDRX_IDLE cycle, $T_{measure,GSM}$ is specified in Table 4.2.2.5.3-1. For UE configured with eDRX_IDLE cycle, $T_{measure,GSM}$ is specified in Table 4.2.2.5.3-2, where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during $T_{measure,GSM}$ when multiple PTWs are used.

Table 4.2.2.5.3-1: T_{measure,GSM},

DRX cycle length [s]	T _{measure,GSM} [s] (number of DRX cycles)
0.32	5.12 (16)
0.64	5.12 (8)
1.28	6.4(5)
2.56	7.68 (3)

Table 4.2.2.5.3-2: T_{measure,GSM} for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s]	T _{measure,GSM} [s] (number of DRX cycles)
5.12 ≤	0.32	≥1	0.96 (3)
eDRX_IDLE cycle length	0.64	≥2	1.92 (3)
	1.28	≥4	3.84 (3)
≤ 2621.44	2.56	≥8	7.68 (3)

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.

NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].

4.2.2.5.4 Measurements of HRPD cells

In order to perform measurement and cell reselection to HRPD cell, the UE shall acquire the timing of HRPD cells.

When the measurement rules indicate that HRPD cells are to be measured, the UE shall measure CDMA2000 HRPD Pilot Strength of HRPD cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter 'Number of HRPD Neighbor Frequency', which is transmitted on E-UTRAN BCCH, is the number of carriers used for all HRPD cells in the neighbour cell list.

When the E-UTRA serving cell fulfils $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$, the UE shall search for CDMA2000 HRPD layers of higher priority at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is defined in clause 4.2.2.

For CDMA2000 HRPD cells which have been detected, the UE shall measure CDMA2000 HRPD Pilot Strength at least every (Number of HRPD Neighbor Frequency)* $T_{measureHRPD}$, when the E-UTRA serving cell Srxlev $\leq S_{nonIntraSearchP}$ or Squal $\leq S_{nonIntraSearchO}$.

The UE shall be capable of evaluating that the CDMA2000 HRPD cell has met cell reselection criterion defined in [1] within $T_{\text{evaluateHRPD}}$.

For UE not configured with eDRX_IDLE cycle, Table 4.2.2.5.4-1 gives values of $T_{measureHRPD}$ and $T_{evaluateHRPD}$. For UE configured with eDRX_IDLE cycle, $T_{measureHRPD}$ and $T_{evaluateHRPD}$ are specified in Table 4.2.2.5.4-2, where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{measureHRPD}$ and $T_{evaluateHRPD}$ when multiple PTWs are used.

Table 4.2.2.5.4-1: T_{measureHRPD} and T_{evaluateHRPD}

DRX cycle length [s]	T _{measureHRPD} [s] (number of DRX cycles)	T _{evaluateHRPD} [s] (number of DRX cycles)	
0.32	5.12 (16)	15.36 (48)	
0.64	5.12 (8)	15.36 (24)	
1.28	6.4 (5)	19.2 (15)	
2.56	7.68 (3)	23.04 (9)	

Table 4.2.2.5.4-2: T_{measureHRPD} and T_{evaluateHRPD} for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s]	T _{measureHRPD} [s] (number of DRX cycles)	T _{evaluateHRPD} [s] (number of DRX cycles)
5.12 ≤	0.32	≥1	0.96 (3)	Note 3 (9)
eDRX_IDLE	0.64	≥2	1.92 (3)	Note 3 (9)
cycle length	1.28	≥4	3.84 (3)	Note 3 (9)
≤ 2621.44	2.56	≥8	7.68 (3)	Note 3 (9)

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.

NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].

NOTE 3: The time is calculated depending on the number N of DRX cycles as follows:

$$eDRX _cycle _length \times \left[\frac{N}{PTW / DRX _cycle _length} \right]$$

If $T_{reselection}$ timer has a non zero value and the CDMA2000 HRPD cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this CDMA2000 HRPD cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

4.2.2.5.5 Measurements of cdma2000 1X

In order to perform measurement and cell reselection to cdma2000 1X cell, the UE shall acquire the timing of cdma2000 1X cells.

When the measurement rules indicate that cdma2000 1X cells are to be measured, the UE shall measure cdma2000 1x RTT Pilot Strength of cdma2000 1X cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter 'Number of CDMA2000 1X Neighbor Frequency', which is transmitted on E-UTRAN BCCH, is the number of carriers used for all cdma2000 1X cells in the neighbour cell list.

When the E-UTRA serving cell fulfils $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$, the UE shall search for cdma2000 1X layers of higher priority at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is defined in clause 4.2.2.

For CDMA2000 1X cells which have been detected, the UE shall measure CDMA2000 1xRTT Pilot Strength at least every (Number of CDMA2000 1X Neighbor Frequency)* $T_{measureCDMA2000_1X}$, when the E-UTRA serving cell Srxlev $\leq S_{nonIntraSearchP}$ or Squal $\leq S_{nonIntraSearchP}$. The UE shall be capable of evaluating that the cdma2000 1X cell has met cell reselection criterion defined in [1] within $T_{evaluateCDMA2000_1X}$.

For UE not configured with eDRX_IDLE cycle, Table 4.2.2.5.5-1 gives values of $T_{measureCDMA2000_1X}$ and $T_{evaluateCDMA2000_1X}$. For UE configured with eDRX_IDLE cycle, $T_{measureCDMA2000_1X}$ and $T_{evaluateCDMA2000_1X}$ are specified in Table 4.2.2.5.5-2 where the requirements apply provided that the serving cell is configured with eDRX_IDLE and is the same in all PTWs during any of $T_{measureCDMA2000_1X}$ and $T_{evaluateCDMA2000_1X}$ when multiple PTWs are used.

Table 4.2.2.5.5-1: T_{measureCDMA2000 1X} and T_{evaluateCDMA2000 1X}

DRX cycle length [s]	T _{measureCDMA2000_1X} [s] (number of DRX cycles)	T _{evaluateCDMA2000_1X} [s] (number of DRX cycles)
0.32	5.12 (16)	15.36 (48)
0.64	5.12 (8)	15.36 (24)
1.28	6.4 (5)	19.2 (15)
2.56	7.68 (3)	23.04 (9)

Table 4.2.2.5.5-2: T_{measureCDMA2000 1X} and T_{evaluateCDMA2000 1X} for UE configured with eDRX_IDLE cycle

eDRX_IDLE cycle length [s]	DRX cycle length [s]	PTW length [s]	T _{measureCDMA2000_1X} [s] (number of DRX cycles)	T _{evaluateCDMA2000_1X} [s] (number of DRX cycles)
5.12 ≤	0.32	≥1	0.96 (3)	Note 3 (9)
eDRX_IDLE	0.64	≥2	1.92 (3)	Note 3 (9)
cycle length	1.28	≥4	3.84 (3)	Note 3 (9)
≤ 2621.44	2.56	≥8	7.68 (3)	Note 3 (9)

NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.

NOTE 2: The eDRX_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].

NOTE 3: The time is calculated depending on the number N of DRX cycles as follows:

$$eDRX _cycle _length \times \left[\frac{N}{ \left\lceil PTW / DRX _cycle _length \right\rceil} \right]$$

If $T_{reselection}$ timer has a non zero value and the CDMA2000 1X cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this CDMA2000 1X cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

4.2.2.6 Evaluation of cell re-selection criteria

The UE shall evaluate the intra-frequency, inter-frequency and inter-RAT cell reselection criteria defined in [1] at least every DRX cycle. When a non zero value of $T_{reselection}$ is used, the UE shall only perform reselection on an evaluation which occurs simultaneously to, or later than the expiry of the $T_{reselection}$ timer.

For UE configured with eDRX_IDLE cycle, the cell reselection criteria shall be evaluated within at least every DRX cycle within the PTW.

4.2.2.7 Maximum interruption in paging reception

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception. When the UE is configured with eDRX_IDLE cycle, the UE shall not miss any paging in a PTW provided the paging is sent in at least [2] DRX cycles before the end of that PTW.

At intra-frequency and inter-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency and inter-frequency cell for paging reception. The interruption time shall not exceed $T_{SI\text{-}EUTRA} + 50$ ms.

At inter-RAT cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-RAT cell. For E-UTRAN to UTRA cell re-selection the interruption time must not exceed $T_{SI\text{-}UTRA} + 50$ ms. For E-UTRAN to GSM cell reselection the interruption time must not exceed $T_{BCCH} + 50$ ms.

 $T_{SI\text{-}EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for a E-UTRAN cell.

 $T_{SI\text{-}UTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in [7] for a UTRAN cell.

T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell defined in [8].

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors and does not take into account cell re-selection failure.

At cell re-selection to HRPD, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable of starting to monitor downlink channels for paging reception of the target HRPD cell. For HRPD cell reselection the interruption time must not exceed $T_{SI-HRPD} + 50$ ms.

 $T_{SI\text{-HRPD}}$ is the time required for receiving all the relevant system information data according to the reception procedure and the upper layer (Layer 3) procedure delay of system information blocks defined in [11] in for HRPD cell.

At cell re-selection to cdma2000 1X, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable of starting to monitor downlink channels for paging reception of the target cdma2000 1X cell. For cdma2000 1X cell re-selection the interruption time must not exceed $T_{SI\text{-}cdma2000\ 1X} + 50$ ms.

 $T_{SI\text{-}cdma2000_1X}$ is the time required for receiving all the relevant system information data according to the reception procedure and the upper layer (Layer 3) procedure delay of system information blocks defined in [15] for cdma2000 1X cell.

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX_IDLE, being configured with eDRX_IDLE cycle, changing eDRX_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE has to meet the requirement corresponding to the second state.

4.2.2.8 void

4.2.2.9 UE measurement capability

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

- Intra-frequency carrier, and
- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 3 TDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 3 FDD UTRA carriers, and
- Depending on UE capability, 3 TDD UTRA carriers, and
- Depending on UE capability, 32 GSM carriers, and
- Depending on UE capability, 3 cdma2000 1x carriers, and
- Depending on UE capability, 3 HRPD carriers.

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

4.2.2.9a UE measurement capability (Increased UE carrier monitoring)

UE which support Increased UE carrier monitoring E-UTRA according to the capabilities in [2,31] shall be capable of monitoring at least

- Depending on UE capability, 8 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 8 TDD E-UTRA inter-frequency carriers

UE which support increased UE carrier monitoring UTRA according to the capabilities in [2,31] shall additionally be capable of monitoring at least

- Depending on UE capability, 6 FDD UTRA carriers, and
- Depending on UE capability, 7 TDD UTRA carriers, and

In addition to the requirements defined above, a UE supporting E-UTRA measurements in RRC_IDLE state and supporting Increased UE carrier monitoring E-UTRA or increased UE carrier monitoring UTRA according to the capabilities in [2,31] shall be capable of monitoring a total of at least 13 carrier frequency layers, which includes serving layer, comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells), cdma2000 1x and HRPD layers.

The requirements in this section apply for UE regardless of their capability to support eDRX_IDLE.

4.2.2.10 Reselection to CSG cells

Note: Requirements in this clause are minimum requirements defined to ensure the testability of autonomous CSG search. Further information on autonomous search times in practical deployments is available in [25].

Reselection from non CSG to CSG cells may be performed using UE autonomous search as defined in [1] when at least one CSG ID is included in the UE's CSG whitelist. The requirements in this clause are valid for reselection to CSG cells previously visited by the UE when the radio configuration parameters, including the carrier frequency and physical cell identity of the CSG cell, non CSG cell and other neighbour cells are unchanged from the most recent previous visit.

NOTE: According to [1], the UE autonomous search function, per UE implementation, determines when and/or where to search for allowed CSG cells.

4.2.2.10.1 Reselection from a non CSG to an inter-frequency CSG cell

The UE shall perform search and reselection to an allowed inter-frequency CSG cell that has met CSG reselection criterion defined in [1] and that is in its whitelist, within 6 minutes in the conditions shown in table 4.2.2.10.1-1. There is no need for statistical testing of this requirement.

Table 4.2.2.10.1-1: Parameters for CSG inter-frequency reselection

Parameter	Unit	Cell 1	Cell 2
EARFCN Note1		Channel 1	Channel 2
CSG indicator		False	True
Physical cell identity ^{Note1}		1	2
CSG identity		Not sent	Sent
			(Already stored
			in UE whitelist
			from previous
			visit)
Propagation conditions		Static, non	
CSG cell previously		Yes	
visited by UE			1
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	0	0
PHICH_RB	dB	0	0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
Qrxlevmin	dBm	-140	-140
N_{oc}	dBm/15 kHz	Off	
RSRP Note2	dBm/15 KHz	-110	-110
Note 1: For this requirement to be applicable, the EARFCN and physical cell			
identity for cell 1 and cell 2 shall be unchanged from when the CSG cell			
was visited previously			
Note 2: Chosen to ensure that CSG autonomous search has a high probability			

4.2.2.10.2 Reselection from a non CSG to an inter-RAT UTRAN FDD CSG cell

of success on every attempt made by UE

The UE shall perform search and reselection to an allowed inter-RAT UTRAN FDD CSG cell that has met CSG reselection criterion defined in [1] and that is in its whitelist, within 6 minutes in the conditions shown in table 4.2.2.10.2-1. There is no need for statistical testing of this requirement.

Table 4.2.2.10.2-1: Parameters for CSG inter-RAT UTRAN FDD reselection

Parameter	Unit	Cell 1	Cell 2
EARFCN Note1		Channel 1	N/A
UARFCN Note1		N/A	Channel 2
CSG indicator		False	True
Physical cell identity ^{Note1}		1	N/A
Primary scrambling code		N/A	Scrambling
Note1			code 2
CSG identity		Not sent	Sent
			(Already stored
			in UE whitelist
			from previous
			visit)
Propagation conditions		Static, non	
CSG cell previously		Ye	S
visited by UE			
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	0	N/A
PHICH_RB	dB	U	IN/A
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
Qrxlevmin	dBm	-140	
N_{oc}	dBm/15 kHz	Off	
RSRP Note2	dBm/15 KHz	-110	
CPICH_RSCP Note2	dBm		-100
CPICH_Ec/lor	dB		-10
PCCPCH_Ec/lor	dB		-12
SCCPCH_Ec/lor	dB	N/A	-12
AICH_Ec/lor	dB		-15
SCH_Ec/lor	dB		-15
PICH_Ec/lor	dB		-15
I_{oc}	dBm/3.84 MHz		Off
Note 1: For this requirement to be applicable, the EARFCN and physical cell			
identity for cell 1 and the UARFCN and scrambling code for cell 2 shall			

be unchanged from when the CSG cell was visited previously

Note 2: Chosen to ensure that CSG autonomous search has a high probability of success on every attempt made by UE

4.2.2.11 Measurement and evaluation requirements for UE in enhanced coverage

4.2.2.11.1 Measurement and evaluation of serving cell

The requirements in this subclause apply if UE is in the enhanced coverage area of the serving cell. The UE category M1 and enhanced coverge applicability of the requirements is defined in section 3.1. The UE is considered to be in enhanced coverage area of serving cell according to RSRP, RSRP £s/Iot, SCH_RP and SCH £s/Iot of the serving cell defined in Annex B.1.3 for a corresponding Band.

The UE shall measure the RSRP level of the serving cell and evaluate the cell selection criterion S defined in [1] for the serving cell at least every DRX cycle.

The UE shall filter the RSRP measurements of the serving cell using at least [4] measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by, at least DRX cycle/2.

If the UE has evaluated in N_{serv_EC} consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated by the serving cell, regardless of the measurement rules currently limiting UE measurement activities.

If the UE in RRC_IDLE has not found any new suitable cell based on searches and measurements using the intra-frequency, inter-frequency and inter-RAT information indicated in the system information for [20] s, the UE shall initiate cell selection procedures for the selected PLMN as defined in [1].

Table 4.2.2.11.1-1: N_{serv EC}

DRX cycle length [s]	N _{serv_EC} [number of DRX cycles]
0.32	[8]
0.64	[8]
1.28	[4]
2.56	[4]

4.2.2.11.2 Measurement and evaluation of intra-frequency E-UTRAN cells

The requirements in this subclause apply if UE is in the enhanced coverage area of the neighbor cell. The UE category M1 and enhanced coverage applicability of the requirements is defined in section 3.1. The UE is considered to be in enhanced coverage area of neighbor cell according to RSRP, RSRP £s/Iot, SCH_RP and SCH £s/Iot of the neighbor cell defined in Annex B.1.3 for a corresponding Band.

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

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS36.304 within $T_{\text{detect,EUTRAN Intra EC}}$ when that Treselection= 0.

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

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

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

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined [1] within $T_{\text{evaluate,E-UTRAN_intra_EC}}$ when $T_{\text{reselection}} = 0$ as specified in Table 4.2.2.11.2-1 provided that the cell is at least 3dB better ranked and additional conditions Table 4.2.2.11.2-2 are met.. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and non-serving intra-frequency cells.

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

Table 4.2.2.11.2-1: T_{detect,EUTRAN Intra EC}, T_{measure,EUTRAN Intra EC} and T_{evaluate, E-UTRAN intra EC}

DRX cycle length [s]	T _{detect,EUTRAN_Intra_EC} [s] (number of DRX cycles)	T _{measure,EUTRAN_intra_EC} [s] (number of DRX cycles)	T _{evaluate,E} - UTRAN_intra_EC [s] (number of DRX cycles)
0.32	330.24 (1032)	1.28 (4)	10.24 (32)
0.64	330.24 (516)	1.28 (2)	10.24 (16)
1.28	524.8 (410)	1.28 (1)	12.8 (10)
2.56	1039.36 (406)	2.56 (1)	15.36 (6)

Table 4.2.2.11.2-2: Conditions on SCH Ês/lot of identified and of the neighbour cell

SCH Ês/lot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/lot: Q2	T _{detect,EUTRAN_Intra} , ca tM1 (S)
-15≤Q1<-6	-15≤ Q2 < -6	As defined in Table Table 4.2.2.11.2-1
-15≤Q1<-6	Q2≥-6	Requirements in 4.2.2 apply
Q1≥ -6	Q2≥-6	Requirements in 4.2.2 apply

4.3 Minimization of Drive Tests (MDT)

UE supporting minimisation of drive tests in RRC_IDLE shall be capable of:

- logging measurements in RRC_IDLE, reporting the logged measurements and meeting requirements in this clause:
- logging of RRC connection establishment failure, reporting the logged failure and meeting requirements in this clause;
- logging of radio link failure and handover failure, reporting the logged failure and meeting requirements in this clause.

4.3.1 Introduction

The logged MDT requirements consist of measurement requirements as specified in clause 4.3.2 and relative time stamp accuracy requirements as specified in clause 4.3.3. Both sets of requirements are applicable for intra-frequency, inter-frequency and inter-RAT cases in RRC_IDLE state. The MDT procedures are described in [27].

For RRC connection establishment failure logging and reporting, the MDT requirements consist of requirements for measurements performed and logged in RRC_IDLE state specified in clause 4.3.2 and relative time stamp accuracy requirement for RRC connection establishment failure log reporting as specified in clause 4.3.4.

4.3.2 Measurements

The requirements specified in this clause apply for the measurements (GSM carrier RSSI, UTRA CPICH RSCP, UTRA CPICH Ec/Io, P-CCPCH RSCP for UTRA 1.28 TDD, E-UTRA RSRP, E-UTRA RSRQ, MBSFN RSRP, MBSFN RSRQ, and MCH BLER) performed and logged by the UE for MDT in RRC_IDLE. The requirements apply for the measurements included in logged MDT reports and RRC connection establishment failure reports.

4.3.2.1 Requirements

The measurement values that are used to meet

- serving cell and reselection requirements as specified in sections 4.2.2.1, 4.2.2.3, 4.2.2.4, 4.2.2.5,
- MBSFN measurement requirements as specified in section 4.4,

shall also apply to values logged for MDT measurements in RRC_IDLE state.

4.3.3 Relative Time Stamp Accuracy

The relative time stamp for a logged measurement is defined as the time from the moment the MDT configuration was received at the UE until the measurement was logged, see TS 36.331 [2].

4.3.3.1 Requirements

The accuracy of the relative time stamping is such that the drift of the time stamping shall be not more than ± 2 seconds per hour.

4.3.4 Relative Time Stamp Accuracy for RRC Connection Establishment Failure Log Reporting

Relative time stamp for RRC connection establishment failure log reporting is defined as the time elapsed from the last RRC connection establishment failure to the time when the log is included in the report TS 36.331 [2]. The UE shall report the RRC connection establishment failure log, while meeting the accuracy requirement specified in clause 4.3.4.1.

4.3.4.1 Requirements

The accuracy of the relative time stamping for RRC connection establishment failure log reporting is such that the drift of the time stamping shall not be larger than \pm 0.72 seconds per hour and \pm 10 seconds over 48 hours. The relative time stamp accuracy requirements shall apply provided that:

- no power off or detach occurs after the RRC connection establishment failure had been detected and until the log is time-stamped.

NOTE: This requirement does not need to be tested.

4.3.5 Relative Time Stamp Accuracy for Radio Link Failure and Handover Failure Log Reporting

The UE shall report the radio link and handover failure log, while meeting the accuracy requirements specified in this section.

4.3.5.1 Requirements for timeSinceFailure

Relative time stamp accuracy requirements for *timeSinceFailure* reported for MDT in a radio link failure or handover failure log are specified in this clause. *timeSinceFailure* determines the time elapsed from the last radio link failure or handover failure in E-UTRA to the time when the log is included in the report TS 36.331 [2].

The accuracy of the relative time stamping for timeSinceFailure is such that the drift of the time stamping shall not be larger than \pm 0.72 seconds per hour and \pm 10 seconds over 48 hours. These relative time stamp accuracy requirements shall apply provided that:

- no power off or detach occurs after the RLF or handover failure had been detected and until the log is time-stamped.

4.4 MBSFN Measurements

4.4.1 Introduction

The requirements specified in Section 4.4 apply for MBSFN measurements (MBSFN RSRP, MBSFN RSRQ, and MCH BLER defined in [4]), which are performed in RRC_IDLE state and logged for MDT by UEs which are MBMS-capable and also indicate their MBSFN measurement logging capability [2].

UE shall measure MBSFN RSRP, MBSFN RSRQ and MCH BLER only in subframes and on carriers where UE is decoding PMCH. The requirements are specified for any carrier where PMCH is received by UE. The requirements specified in this section apply for any carrier frequency with configured MBSFN subframes with PMCH, which may be the same as or different from any serving unicast carrier.

The UE receiving PMCH on any non-serving carrier and performing MBSFN measurements shall not cause interruptions on any serving carrier in the subframes with paging and non-MBSFN multicast transmissions such as system information.

4.4.2 MBSFN RSRP measurements

For UE in RRC_IDLE, the physical layer shall be capable of performing the MBSFN RSRP measurement [4] within the MBSFN RSRP measurement period and log the measurement, while meeting the MBSFN RSRP measurement accuracy requirements specified in section 9.8.2. The MBSFN RSRP measurement logging shall be according to the MBSFN RSRP measurement report mapping specified in Section 9.8.2.2.

The MBSFN RSRP measurement period is defined as MAX(640 ms, period during which the UE decodes [5, Section 10] 5 subframes containing PMCH transmissions).

The same requirement applies for UE configured with DRX or eDRX_IDLE.

4.4.3 MBSFN RSRQ measurements

For UE in RRC_IDLE, the physical layer shall be capable of performing the MBSFN RSRQ measurement [4] within the MBSFN RSRP measurement period and report the measurement, while meeting the MBSFN RSRQ measurement accuracy requirements specified in section 9.8.3. The MBSFN RSRQ measurement logging shall be according to the MBSFN RSRQ measurement report mapping specified in Section 9.8.3.2.

The MBSFN RSRQ measurement period is defined as MAX(640 ms, period during which the UE decodes [5, Section 10] 5 subframes containing PMCH transmissions).

The same requirement applies for UE configured with DRX or eDRX_IDLE.

4.4.4 MCH BLER measurements

The UE physical layer shall be capable of performing and logging the MCH BLER measurement [4] within the MCH BLER measurement period.

The MCH BLER measurement period is equal to the MBSFN logging interval configured by higher layers [2].

The MCH BLER logging shall be according to the MCH BLER measurement report mapping specified in Section 9.8.4.

The same requirement applies for UE configured with DRX or eDRX IDLE.

4.5 Proximity-based Services

4.5.1 Introduction

This section contains the requirements for the UE capable of ProSe Direct Communication and/or ProSe Direct Discovery in RRC_IDLE state.

4.5.2 Requirements

When a UE in RRC_IDLE state is participating in transmissions and/or reception for ProSe Direct Discovery and/or ProSe Direct Communication, the UE shall meet all the requirements of Section 4.

Note: The UE may need to interrupt ProSe operation in order to meet the requirements of Section 4.

4.5.2.1 Interruptions with ProSe Direct Discovery

A UE capable of ProSe direct discovery in RRC_IDLE state shall not cause any interruption for the reception of paging and system information:

- while switching reception between ProSe Direct Discovery and a serving cell, or
- when receiving ProSe direct discovery signals or
- while switching receiver chain ON/OFF for ProSe Direct Discovery reception if the UE has a dedicated receiver chain for ProSe Direct Discovery

4.5.2.2 Interruptions with ProSe Direct Communication

A UE capable of ProSe direct communication in RRC_IDLE state shall not cause any interruption for the reception of paging and system information:

- while switching reception between ProSe Direct Communication and a serving cell, or
- when receiving ProSe direct communication signals, or
- while switching receiver chain ON/OFF for ProSe Direct Communications reception.

4.5.2.3 Initiation/Cease of SLSS transmissions with ProSe Direct Discovery

The requirements in this subclause are applicable to a UE capable of ProSe Direct Discovery and SLSS transmission and reception.

The requirements apply when the conditions for SLSS transmissions specified in [2] are met; *networkControlledSyncTx* is not configured; and *syncTxThreshIC* is included in *SystemInformationBlockType19*. The UE shall be capable of measuring the RSRP of the cell used to transmit Prose Direct Discovery announcements and evaluate to initiate/cease SLSS transmissions within T_{evaluate,SLSS} as specified in Table 4.5.2.3-1.

Table 4.5.2.3-1: T_{evaluate,SLSS} with ProSe Direct Discovery

DRX cycle length [s]	T _{evaluate,SLSS} [s] (number of DRX cycles)
0.32	1.92 (6)
0.64	3.84 (6)
1.28	7.68 (6)
2.56	15.36 (6)

For the cell used to transmit ProSe Direct Discovery announcements:

- RSRP related side conditions given in Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in Clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band are fulfilled.

4.5.2.4 Initiation/Cease of SLSS transmissions with ProSe Direct Communication

The requirements in this subclause are applicable to a UE capable of ProSe Direct Communication.

The requirements apply when the conditions for SLSS transmissions specified in [2] are met; networkControlledSyncTx is not configured; and syncTxThreshIC is included in SystemInformationBlockType18. The UE shall be capable of measuring the RSRP of the cell used to transmit ProSe Direct Communication and evaluate to initiate/cease SLSS transmissions within $T_{evaluate,SLSS}$ as specified in Table 4.5.2.4-1.

Table 4.5.2.4-1: Tevaluate.SLSS with ProSe Direct Communication

DRX cycle length [s]	T _{evaluate,SLSS} [s] (number of DRX cycles)
0.32	1.92 (6)
0.64	3.84 (6)
1.28	7.68 (6)
2.56	15.36 (6)

For the cell used to transmit ProSe Direct Communication:

- RSRP related side conditions given in Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in Clause 9.1.5.1 for a corresponding Band are fulfilled,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band are fulfilled.

5 E-UTRAN RRC_CONNECTED state mobility

Note 1: For the performance requirements specified hereafter, the state when no DRX is used is defined as follows:

- DRX and eDRX_CONN parameters are not configured; or
- DRX or eDRX CONN parameters are configured and
 - o drx-InactivityTimer is running; or
 - o drx-RetransmissionTimer is running; or
 - o mac-ContentionResolutionTimer is running; or
 - a Scheduling Request sent on PUCCH is pending; or
 - o an uplink grant for a pending HARQ retransmission can occur and there is data in the corresponding HARQ buffer; or
 - a PDCCH indicating a new transmission addressed to the C-RNTI of the UE has not been received after successful reception of a Random Access Response for the explicitly signaled preamble (only applicable to UEs in RRC CONNECTED).

Otherwise

- It is the state when DRX is used.

Note 2: Unless otherwise stated, the requirements in sections 5.1, 5.2.2.2, 5.2.2.3, 5.2.2.4, 5.3 and 5.4 are also applicable when a UE is configured with Scell(s) or PSCell.

5.1 E-UTRAN Handover

5.1.1 Introduction

5.1.2 Requirements

5.1.2.1 E-UTRAN FDD – FDD

The requirements in this clause are applicable to both intra-frequency and inter-frequency handovers.

5.1.2.1.1 Handover delay

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [2].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

 $D_{handover}$ equals the maximum RRC procedure delay to be defined in clause 11.2 in TS 36.331 [2] plus the interruption time stated in clause 5.1.2.1.2.

5.1.2.1.2 Interruption time

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency or inter-frequency handover is commanded, the interruption time shall be less than Tinterrupt

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

 T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

 T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in Clause 8.1.2.2.1 for intra-frequency handover and Clause 8.1.2.3.1 for inter-frequency handover.

5.2.2.2 E-UTRAN FDD – TDD

The requirements in this clause are applicable to handover from FDD to TDD. The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 5.2.2.4 apply for this section.

5.2.2.2.1 (Void)

5.2.2.2 (Void)

5.2.2.3 E-UTRAN TDD – FDD

The requirements in this clause are applicable to handover from TDD to FDD. The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 5.1.2.1 apply for this section.

5.2.2.3.1 (Void)

5.2.2.3.2 (Void)

5.2.2.4 E-UTRAN TDD – TDD

The requirements in this clause are applicable to both intra-frequency and inter-frequency handovers.

5.2.2.4.1 Handover delay

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [2].

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

D_{handover} equals the maximum RRC procedure delay to be defined in clause 11.2 in TS 36.331 [2] plus the interruption time stated in clause 5. 2.2.4.2.

5.2.2.4.2 Interruption time

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency or inter-frequency handover is commanded, the interruption time shall be less than Tinterrupt

$$T_{interrupt} \equiv T_{search} + T_{IU} + 20 \ ms$$

Where

 T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

 T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in Clause 8.1.2.2.2 for intra-frequency handover and Clause 8.1.2.3.4 for inter-frequency handover.

5.2.2.5 E-UTRAN HD – FDD

The requirements in this clause are applicable to intra-frequency handovers.

5.2.2.5.1 Handover delay

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [2].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where

 $D_{handover}$ equals the maximum RRC procedure delay to be defined in clause 11.2 in TS 36.331 [2] plus the interruption time stated in clause 5.1.2.1.2.

5.2.2.5.2 Interruption time

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than Tinterrupt

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

 T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then $T_{search} = 0$ ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then $T_{search} = 80$ ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

 T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in Clause 8.1.2.2.1 for intra-frequency handover.

5.3 Handover to other RATs

5.3.1 E-UTRAN - UTRAN FDD Handover

5.3.1.1 Introduction

The purpose of inter-RAT handover from E-UTRAN to UTRAN FDD is to change the radio access mode from E-UTRAN to UTRAN FDD. The handover procedure is initiated from E-UTRAN with a RRC message that implies a hard handover as described in TS 36.331 [2].

5.3.1.1.1 Handover delay

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

where:

- D_{handover} equals the RRC procedure delay, which is 50 ms plus the interruption time stated in clause 5.3.1.1.2.

5.3.1.1.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than T_{interrupt1}

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC} ms$$

If the target cell is unknown the interruption time shall be less than Tinterrupt2

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} + T_{MC} ms$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. Performance requirements for E-UTRA to UTRA soft handover are not specified. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of $T_0 + 148$ chips.

Where:

 T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

 F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell. If HS-PDSCH is configured in the UTRA target cell, F_{max} is 4 radio frames.

 T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [20], clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} =0 ms.

Otherwise T_{sync}=40 ms.

 T_{MC} is 0ms if a single UTRA cell is configured as the handover target, otherwise 20ms if handover

to UTRA with 1, 2 or 3 UTRA carriers with secondary HS-PDSCH is configured.

The phase reference is the primary CPICH.

The requirements in this clause assume that N312 has the smallest possible value i.e. only one insync is required.

5.3.2 E-UTRAN - UTRAN TDD Handover

5.3.2.1 Introduction

The purpose of inter-RAT handover from E-UTRAN to UTRAN TDD is to change the radio access mode from E-UTRAN to UTRAN TDD. The handover procedure is initiated from E-UTRAN with a RRC message that implies a hard handover as described in TS 36.331 [2].

5.3.2.2 Requirements

The requirements in this clause shall apply to UE supporting E-UTRAN and UTRAN TDD.

5.3.2.2.1 Handover delay

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the SYNC-UL within $D_{handover}$ seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

- D_{handover} equals the RRC procedure delay, which is 50 ms plus the interruption time stated in clause 5.3.2.2.

5.3.2.2.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1} = T_{offset} + T_{UL} + 30*F_{SFN} + 20 ms$$

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{offset} + T_{UL} + 30*F_{SFN} + 180 \text{ ms}$$

Where:

T_{offset} Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} Equal to 1 if SFN decoding is required and equal to 0 otherwise

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

5.3.3 E-UTRAN - GSM Handover

5.3.3.1 Introduction

The purpose of inter-RAT handover from E-UTRAN to GSM is to transfer a connection between the UE and E-UTRAN to GSM. The handover procedure is initiated from E-UTRAN with a RRC message (MOBILITY FROM E-UTRA). The procedure is described in in TS 36.331 [2].

5.3.3.2 Requirements

The requirements in this clause shall apply to UE supporting E-UTRAN and GSM.

The requirements given below in Tables 5.3.3.2.1-1 and 5.3.3.2.2-1 for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [2].

5.3.3.2.1 Handover delay

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in [10]) on the channel of the new RAT within the value in table 5.3.3.2.1-1 from the end of the last TTI containing the RRC command. The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.3.3.2.1-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the	90
RRC MOBILITY FROM E-UTRA COMMAND is received	
The UE has not synchronised to the GSM cell before	190
the RRC MOBILITY FROM E-UTRA COMMAND is	
received	

5.3.3.2.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value specified in table 5.3.3.2.2-1.

Table 5.3.3.2.2-1: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the	40
RRC MOBILITY FROM E-UTRA COMMAND is received	
The UE has not synchronised to the GSM cell before	140
the RRC MOBILITY FROM E-UTRA COMMAND is	
received	

5.4 Handover to Non-3GPP RATs

5.4.1 E-UTRAN – HRPD Handover

5.4.1.1 Introduction

The handover procedure from E-UTRAN to HRPD is initiated when E-UTRAN sends handover command to the UE through dedicated RRC signalling.

5.4.1.1.1 Handover delay

The handover delay (D_{handover}) is defined as the sum of the RRC procedure delay, which is 50 ms and the interruption time specified in clause 5.4.1.1.2.

When the UE receives a RRC message implying handover to HRPD, the UE shall be ready to start the transmission of the new reverse control channel in HRPD within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

5.4.1.1.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [13], the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O ms$$

Where:

 T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell. T_{IU} can be up to one HRPD frame (26.66 ms).

SW_K is
$$SW_K = \left[\frac{srch_win_k}{60} \right]$$
 where $srch_win_k$ is the number of HRPD chips indicated by the

search window for known target HRPD cells in the message

$$SW_O$$
 is $SW_O = \left\lceil \frac{srch_win_o}{60} \right\rceil$ where $srch_win_o$ is the number of HRPD chips indicated by the

search window for unknown target HRPD cells in the message

KC It is the number of known target HRPD cells in the message, and

OC It is the number of unknown target HRPD cells in the message.

Note: An additional delay in the interruption time may occur due to the reverse link silence interval [11], which is specific to HRPD.

5.4.2 E-UTRAN – cdma2000 1X Handover

5.4.2.1 Introduction

The handover procedure from E-UTRAN to cdma2000 1X is initiated when E-UTRAN sends handover command to the UE through dedicated RRC signalling.

5.4.2.1.1 Handover delay

The handover delay ($D_{handover}$) is defined as the sum of the RRC procedure delay, which is 130 ms and the interruption time specified in clause 5.4.2.1.2.

When the UE receives a RRC message implying handover to cdma2000 1X, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1X within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

5.4.2.1.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1X, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1X cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 4.2.1 of [14], the interruption time shall be less than T_{interrupt}:

$$T_{interrupt} = T_{IU} + 140 + 10*KC*SW_K + 10*OC*SW_O ms$$

Where:

 $T_{\rm IU}$ It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1X cell. $T_{\rm IU}$ can be up to one cdma2000 1X frame (20 ms).

SW_K is
$$SW_K = \left[\frac{srch_win_k}{300} \right]$$
 where srch_win_k is the number of cdma2000 1x chips indicated by

the search window for known target cdma2000 1x cells in the message

$$SW_{O} \qquad \qquad \text{is } SW_{O} = \left\lceil \frac{srch_win_o}{300} \right\rceil \text{ where } srch_win_o \text{ is the number of } cdma2000 \text{ 1x chips indicated by}$$

the search window for unknown target cdma2000 1x cells in the message

KC It is the number of known target cdma2000 1X cells in the message, and

OC It is the number of unknown target cdma2000 1X cells in the message.

6 RRC Connection Mobility Control

6.1 RRC Re-establishment

The requirements in this clause are applicable to both E-UTRAN FDD and TDD.

6.1.1 Introduction

RRC connection re-establishment is initiated when a UE in RRC connected mode looses RRC connection due to any of these reasons: radio link failure, handover failure or radio link problem. The RRC es-tablishment procedure is specified in clause 5.3.7 in TS 36.331 [2].

6.1.2 Requirements

In RRC connected mode the UE shall be capable of sending RRCConnectionReestablishmentRequest message within $T_{re\text{-establish_delay}}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-establish_delay}}$) shall be less than:

$$T_{re-establish_delay} = T_{UL_grant} + T_{UE_re-establish_delay}$$

 T_{UL_grant} : It is the time required to acquire and process uplink grant from the target PCell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay (T_{UE re-establish delay}) is specified in clause 6.1.2.1.

6.1.2.1 UE Re-establishment delay requirement

The UE re-establishment delay ($T_{UE_re-establish_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends PRACH to the target PCell. The UE re-establishment delay ($T_{UE_re-establish_delay}$) requirement shall be less than:

$$T_{UE\text{-re-establish_delay}} = 50 \text{ ms} + N_{freq} * Tsearch + T_{SI} + T_{PRACH}$$

T_{search}: It is the time required by the UE to search the target PCell.

 $T_{\text{search}} = \text{It is } 100 \text{ ms if the target PCell is known by the UE; the target PCell is known if it has been measured by the UE in the last 5 seconds.}$

 T_{search} = It is 800 ms if the target PCell is unknown by the UE; the target PCell is unknown if it has not been measured by the UE in the last 5 seconds.

 T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for the target PCell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

 N_{freq} : It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; $N_{\text{freq}} = 1$ if the target PCell is known.

There is no requirement if the target cell does not contain the UE context.

6.2 Random Access

6.2.1 Introduction

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213[3] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[17]. Contention based random access procedures can only be carried out on PCell and PSCell, while non-contention based random access procedures can be carried out on PCell, one or two activated SCell(s), and PSCell.

6.2.2 Requirements

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula defined in TS 36.213[3] and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in table 6.3.5.1.1-1 of TS 36.101[5]. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of 36.101[5].

The UE shall indicate a Random Access problem to upper layers if the maximum number of preamble transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [17].

The UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [17].

6.2.2.1 Contention based random access

6.2.2.1.1 Correct behaviour when receiving Random Access Response reception

The UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

6.2.2.1.2 Correct behaviour when not receiving Random Access Response reception

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321.

6.2.2.1.3 Correct behaviour when receiving a NACK on msg3

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

6.2.2.1.4 Void

6.2.2.1.5 Correct behaviour when receiving a message over Temporary C-RNTI

The UE shall send ACK if the Contention Resolution is successful.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

6.2.2.1.6 Correct behaviour when contention Resolution timer expires

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if the Contention Resolution Timer expires.

6.2.2.2 Non-Contention based random access

6.2.2.2.1 Correct behaviour when receiving Random Access Response

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

6.2.2.2.2 Correct behaviour when not receiving Random Access Response

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

6.2.3 Requirements for Cat-M1 UEs

In addition to the requirements defined in 6.2.1 and 6.2.2, a Cat-M1 UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [17] using the PRACH configuration contained in *PRACH-ConfigSIB* in TS 36.331 [2]

- Determines the enhanced coverage level based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* [2]) as defined in section 5.1.1, TS 36,321 [17],

- Selects PRACH resources [2] configured for the corresponding enhanced coverage level as determined in the previous step and;
- Transmits or re- transmits PRACH preamble using the selected PRACH resources and PRACH configuration.

6.3 RRC Connection Release with Redirection

6.3.1 Introduction

RRC connection release with redirection is initiated by the UE upon receiving the "RRCConnectionRelease" message from the E-UTRAN, TS 36.331 [2]. The RRC connection release with redirection procedure is specified in clause 5.3.8 in TS 36.331 [2].

The requirements in this clause are applicable to both E-UTRAN FDD and TDD.

6.3.2 Requirements

6.3.2.1 RRC connection release with redirection to UTRAN FDD

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within $T_{connection_release_redirect_UTRA\,FDD}$.

The time delay ($T_{connection_release_redirect_UTRA\ FDD}$) is the time between the end of the last TTI containing the RRC command, "RRCConnectionRelease" (TS 36.331 [2]) on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ($T_{connection_release_redirect_UTRA\ FDD}$) shall be less than:

$$T_{connection_release_redirect_UTRA\ FDD} = T_{RRC_procedure_delay} + T_{identify_UTRA\ FDD} + T_{SI_UTRA\ FDD} + T_{RA}$$

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io \geq -15 dB,
- SCH_Ec/Io ≥ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

 $T_{RRC_procedure_delay}$: It is the RRC procedure for processing the received message "RRCConnectionRelease". It shall be less than 110 ms.

 $T_{identify\text{-}UTRA\,FDD}$: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

 $T_{SI\text{-}UTRA\ FDD}$: It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

 T_{RA} : It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

6.3.2.2 RRC connection release with redirection to GERAN

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within $T_{\text{connection_release_redirect_GERAN}$.

The time delay ($T_{connection_release_redirect_GERAN}$) is the time between the end of the last TTI containing the RRC command, "RRCConnectionRelease" (TS 36.331 [2]) on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ($T_{connection_release_redirect_GERAN}$) shall be less than:

$$T_{connection_release_redirect_\ GERAN} = T_{RRC_procedure_delay} + T_{identify_GERAN} + T_{SI_GERAN} + T_{RA}$$

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in [9].

T_{RRC_procedure_delay}: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

 $T_{identify-UTRA\;GERAN}$: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

 $T_{SI\text{-}UTRA\ GERAN}$: It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

 T_{RA} : It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

6.3.2.3 RRC connection release with redirection to UTRAN TDD

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within $T_{connection_release_redirect_UTRA\ TDD}$.

The time delay (T_{connection_release_redirect_UTRA TDD}) is the time between the end of the last TTI containing the RRC command, "RRCConnectionRelease" (TS 36.331 [2]) on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay (T_{connection_release_redirect_UTRA TDD}) shall be less than:

 $T_{connection_release_redirect_UTRA\ TDD} = T_{RRC_procedure_delay} + T_{identify_UTRA\ TDD} * N_{redirect_UTRA\ TDD} + T_{SI_UTRA\ TDD} + T_{RA}$

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io \geq -6 dB,
- DwPCH Ec/Io > -1 dB.

T_{RRC_procedure_delay}: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

 $T_{identify-UTRA\ TDD}$: It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

 $T_{SI\text{-}UTRA\ TDD}$: It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

 T_{RA} : It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

 $N_{redirect-UTRA\ TDD}$: It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "RRCConnectionRelease" message. It can be up to 4 UTRA TDD frequencies.

6.4 CSG Proximity Indication for E-UTRAN and UTRAN

6.4.1 Introduction

The requirements defined in this section are applicable to a UE supporting and configured with CSG proximity indication and are valid when a UE is entering the proximity of one or more CSG member cell(s) or leaving the proximity of all CSG member cell(s) on a UTRA or E-UTRA frequency as specified in [2].

The detection of CSG proximity is based on a UE autonomous search function.

6.4.2 Requirements

The UE shall initiate transmission of the ProximityIndication message with "entering" according to [2] within [6] minutes after entering the proximity of one or more CSG member cell(s) on a UTRA or E-UTRA frequency.

The UE shall initiate transmission of the ProximityIndication message with "leaving" according to [2] within [6] minutes after leaving the proximity of all CSG member cell(s) on a UTRA or E-UTRA frequency.

There is no need for statistical testing of this requirement.

NOTE: Entering the proximity of one or more CSG member cell(s) means that the UE is near a cell whose CSG ID is in the UE's CSG whitelist (as determined based on autonomous search procedures). Leaving the proximity of one or more CSG member cell(s) means that the UE is no longer near any cell whose CSG ID is in the UE's CSG whitelist.

7 Timing and signalling characteristics

7.1 UE transmit timing

7.1.1 Introduction

The UE shall have capability to follow the frame timing change of the connected eNode B. The uplink frame transmission takes place $(N_{\text{TA}} + N_{\text{TA offset}}) \times T_{\text{s}}$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell. The UE shall be configured with a pTAG containing the PCell. The pTAG may also contain up to four SCells, if configured. The UE capable of supporting multiple timing advances [2] may also be configured with one or two serving cells with uplink in one or two sTAG and pTAG.

The other downlink SCell(s), if configured, will be contained in either the pTAG or the sTAG(s). In pTAG, UE shall use the PCell as the reference cell for deriving the UE transmit timing for cells in the pTAG. When the UE capable of supporting multiple timing advance [2] is configured with one or two sTAG(s), the UE shall use an activated SCell from the sTAG for deriving the UE transmit timing for cells in the sTAG. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements. The requirements in clause 7 apply to all TAGs.

The UE capable of supporting dual connectivity shall be configured with one pTAG and may also be configured with one psTAG. The pTAG shall contain the PCell and may also contain one SCell, if configured. The psTAG shall contain the PSCell and may also contain one SCell, if configured. In pTAG, UE shall use the PCell as the reference cell for deriving the UE transmit timing for pTAG, and in psTAG, UE shall use the PSCell as the reference cell for deriving the UE transmit timing for psTAG. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements. The requirements in clause 7 apply to both TAGs.

7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX or eDRX_CONN cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{TA_Ref} + N_{TA \text{ offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. N_{TA_Ref} for PRACH is defined as 0. $(N_{TA_Ref} + N_{TA \text{ offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. N_{TA_Ref} for other channels is not changed until next timing advance is received.

Table 7.1.2-1: Te Timing Error Limit

Downlink Bandwidth (MHz)	T _{e_}
1.4	24*T _S
≥3 12*T _S	
Note: T _S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. The UE is required to adjust its timing to within $\pm T_e$ in a TAG when,

- changing the downlink SCell for deriving the UE transmit timing for cells in the sTAG configured with one or two uplinks,
- in this TAG the transmission timing error between the UE and the reference timing exceeds \pm Te,
- configured with a pTAG and one or two sTAG, the transmission timing difference between TAGs does not exceed the maximum transmission timing difference (i.e., 32.47us) after such adjustment.

If the transmission timing difference after such adjustment is bigger than the maximum transmission timing difference (i.e., 32.47us) UE may stop adjustment in this TAG. The reference timing shall be $(N_{TA_Ref} + N_{TA offset}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing under the above mentioned scenarios shall follow these rules:

- 1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.
- 2) The minimum aggregate adjustment rate shall be $7*T_S$ per second.
- 3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.2-2.

Table 7.1.2-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T _{q_}
1.4	17.5*T _S
3	9.5*T _S
5	5.5*T _S
≥10	3.5*T _S
Note: T _S is the basic timing unit defined in TS 36.211	

7.2 UE timer accuracy

7.2.1 Introduction

UE timers are used in different protocol entities to control the UE behaviour.

7.2.2 Requirements

For UE timers specified in TS 36.331 [2], UE shall comply with the timer accuracies according to Table 7.2.2-1.

The requirements are only related to the actual timing measurements internally in the UE. They do not include the following:

- Inaccuracy in the start and stop conditions of a timer (e.g. UE reaction time to detect that start and stop conditions of a timer is fulfilled), or
- Inaccuracies due to restrictions in observability of start and stop conditions of a UE timer (e.g. TTI alignment when UE sends messages at timer expiry).

Table 7.2.2-1

Timer value [s]	Accuracy
timer value < 4	± 0.1s
timer value ≥ 4	± 2.5%

7.3 Timing Advance

7.3.1 Introduction

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance, see TS 36.321 [17] clause 5.2.

7.3.2 Requirements

7.3.2.1 Timing Advance adjustment delay

UE shall adjust the timing of its uplink transmission timing at sub-frame n+6 for a timing advance command received in sub-frame n.

7.3.2.2 Timing Advance adjustment accuracy

The UE shall adjust the timing of its transmissions with a relative accuracy better than or equal to $\pm 4*$ T_S seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiples of 16* T_S and is relative to the current uplink timing.

7.4 Cell phase synchronization accuracy (TDD)

7.4.1 Definition

Cell phase synchronization accuracy is defined as the maximum absolute deviation in frame start timing between any pair of cells on the same frequency that have overlapping coverage areas.

7.4.2 Minimum requirements

For Wide Area BS, the cell phase synchronization accuracy measured at BS antenna connectors shall be better than the requirement specified in table 7.4.2-1. If a cell's coverage area overlaps with another cell with different cell radius then the cell phase synchronization accuracy corresponding to the larger of the two cell sizes applies to the overlapping cells with different radii.

Table 7.4.2-1 Cell phase synchronization requirement for wide area BS (TDD)

Cell Type	Cell Radius	Requirement
Small cell	≤ 3 km	≤ 3 μs
Large cell	> 3 km	≤ 10 us

For Home BS, the cell phase synchronization accuracy measured at BS antenna connectors shall be better than the requirement specified in table 7.4.2-2.

Table 7.4.2-2 Cell phase synchronization requirement for Home BS (TDD)

Source Cell Type	Propagation Distance	Requirement
Small cell	≤ 500 m	≤ 3 μs
Large cell	> 500 m	\leq 1.33 + $T_{propagation}$ µs

Note 1: $T_{propagation}$ is the propagation delay between the Home BS and the cell selected as the network listening synchronization source. In terms of the network listening synchronization source selection, the best accurate synchronization source to GNSS should be selected.

Note 2: If the Home BS obtains synchronization without using network listening, the small cell requirement applies.

7.5 Synchronization Requirements for E-UTRAN to 1xRTT and HRPD Handovers

7.5.1 Introduction

This clause contains the synchronization requirements for eNodeB capable of supporting E-UTRAN to CDMA 1xRTT and HRPD handovers. To facilitate E-UTRAN to CDMA 1xRTT and HRPD handovers, the CDMA System Time reference needs to be provided to the UE in order for the UE to report the pilot PN phases of the target 1xRTT or HRPD cells. This is achieved through the SIB8 message broadcasted by the serving eNodeB:

If the eNodeB is synchronized to the GPS time and the LTE system frame is aligned with the start of CDMA System Time, then the size of CDMA System Time information is 39 bits and the unit is 10 ms based on a 1.2288 Mcps chip rate.

If the eNodeB is not synchronized to the GPS time or if the eNodeB is synchronized to the GPS time but its LTE system frame not aligned with the start of CDMA System time, then the size of CDMA System Time information is 49 bits and the unit is 8 CDMA chips based on 1.2288 Mcps chip rate.

The CDMA system time reference provided by the serving eNodeB has to be within a certain level of accuracy in order to facilitate accurate reporting of the pilot PN phases of the target 1xRTT or HRPD cells and enable reliable handover to the 1xRTT or HRPD networks.

7.5.2 eNodeB Synchronization Requirements

7.5.2.1 Synchronized E-UTRAN

The eNodeB shall be synchronized to the GPS time. With external source of CDMA System Time disconnected, the eNodeB shall maintain the timing accuracy within $\pm 10~\mu s$ of CDMA System Time for a period of not less than 8 hours.

The timing deviation between the SFN boundary at or immediately after the ending boundary of the SI-window in which *SystemInformationBlockType8* is transmitted and the broadcasted CDMA System Time shall be within 10 μs.

7.5.2.2 Non-Synchronized E-UTRAN

The timing deviation between the SFN boundary at or immediately after the end of the boundary of the SI-window in which SystemInformationBlockType8 is transmitted and the broadcasted CDMA System Time shall be within 10 μ s. With external source of CDMA System Time disconnected the SFN boundary at or immediately after the broadcasted CDMA System Time in the SIB8 message shall maintain the timing accuracy within $\pm 10~\mu$ s of CDMA System Time for a period of not less than 8 hours.

7.6 Radio Link Monitoring

7.6.1 Introduction

The UE shall monitor the downlink link quality based on the cell-specific reference signal in order to detect the downlink radio link quality of the PCell and PSCell as specified in [3].

The UE shall estimate the downlink radio link quality and compare it to the thresholds Q_{out} and Q_{in} for the purpose of monitoring downlink radio link quality of the PCell and PSCell.

The threshold Q_{out} is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to 10% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.6.1-1.

The threshold Q_{in} is defined as the level at which the downlink radio link quality can be significantly more reliably received than at Q_{out} and shall correspond to 2% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.6.1-2.

When higher-layer signalling indicates certain subframes for restricted radio link monitoring, the radio link quality shall be monitored as specified in [3].

The requirements in sections 7.6.2.1, 7.6.2.2 and 7.6.2.3 shall also apply when a time domain measurement resource restriction pattern for performing radio link monitoring measurements is configured by higher layers (TS 36.331 [2]), with or without CRS assistance information, provided that also the following additional condition is fulfilled:

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the radio link monitoring measurements,

When the CRS assistance information is provided, the transmission bandwidth [30] in all intra-frequency cells in the CRS assistance information [2] is the same or larger than the transmission bandwidth of the PCell for which radio link monitoring is performed.

When the CRS assistance information is provided, the requirements in Section 7.6 shall also be met when the number of transmit antenna ports [16] of one or more cells whose CRS assistance information is provided [2] is different from the number of transmit antenna ports of the cell for which radio link monitoring is performed.

NOTE: If the UE is not provided with the CRS assistance information (TS 36.331 [2]) or the CRS assistance data is not valid throughout the entire evaluation period, then similar Release 8 and 9 requirements apply for time domain measurements restriction under colliding CRS with ABS configured in non-MBSFN subframes.

Table 7.6.1-1 PDCCH/PCFICH transmission parameters for out-of-sync

Attribute	Value
DCI format	1A
Number of control OFDM symbols	2; Bandwidth ≥ 10 MHz
	3; 3 MHz ≤ Bandwidth ≤ 10 MHz
	4; Bandwidth = 1.4 MHz
Aggregation level (CCE)	4; Bandwidth = 1.4 MHz
	8; Bandwidth ≥ 3 MHz
Ratio of PDCCH RE energy to average RS RE energy	4 dB; when single antenna port is used for cell- specific reference signal transmission by the PCell or PSCell. 1 dB: when two or four antenna ports are used
	for cell-specific reference signal transmission by the PCell or PSCell.
Ratio of PCFICH RE energy to average RS RE energy	4 dB; when single antenna port is used for cell- specific reference signal transmission by the PCell or PSCell.
	1 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the PCell or PSCell.
Note 1: DCI format 1A is defined in clause 5.3.3.1.3 in TS 36.212 [21]. Note 2: A hypothetical PCFICH transmission corresponding to the number of control symbols shall be assumed.	

Table 7.6.1-2 PDCCH/PCFICH transmission parameters for in-sync

Attribute	Value
DCI format	1C
Number of control OFDM symbols	2; Bandwidth ≥ 10 MHz
	3; 3 MHz ≤ Bandwidth ≤ 10 MHz
	4; Bandwidth = 1.4 MHz
Aggregation level (CCE)	4
Ratio of PDCCH RE energy to average RS RE energy	0 dB; when single antenna port is used for cell- specific reference signal transmission by the PCell or PSCell.
	-3 dB; when two or four antenna ports are used for cell-specific reference signal transmission by the PCell or PSCell.
Ratio of PCFICH RE energy to average RS RE energy	4 dB; when single antenna port is used for cell- specific reference signal transmission by the PCell or PSCell.
	1 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the PCell or PSCell.
Note 1: DCI format 1C is defined in clause 5.3.3.1.4 in TS 36.212 [21]. Note 2: A hypothetical PCFICH transmission corresponding to the number of control symbols shall be assumed.	

7.6.2 Requirements

7.6.2.1 Minimum requirement when no DRX is used

When the downlink radio link quality of the PCell or PSCell estimated over the last 200 ms period becomes worse than the threshold Q_{out} , Layer 1 of the UE shall send an out-of-sync indication for the PCell or PSCell to the higher layers within 200 ms Q_{out} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell or PSCell estimated over the last 100 ms period becomes better than the threshold Q_{in} , Layer 1 of the UE shall send an in-sync indication for the PCell or PSCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

When the UE creates autonomous gaps for identification the CGI of an E-UTRA intra-frequency cell or an E-UTRA inter-frequency cell and when higher-layer signalling indicates certain subframes for restricted radio link monitoring, the UE shall also perform radio link monitoring. In this case, the Q_{out} evaluation period ($T_{Evaluate}Q_{out}$) is 200 ms, and the Q_{in} evaluation period ($T_{Evaluate}Q_{in}$) is 100 ms $^{Note\ 1}$.

Note 1: This RLM requirement does not need to be tested.

The out-of-sync and in-sync evaluations of the PCell or PSCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [2].

7.6.2.2 Minimum requirement when DRX is used

When DRX is used the Q_{out} evaluation period ($T_{Evaluate}Q_{out}DRX$) and the Q_{in} evaluation period ($T_{Evaluate}Q_{in}DRX$) specified in Table 7.6.2.2-1 will be used.

When higher-layer signalling indicates certain subframes for restricted radio link monitoring, the Q_{out} evaluation period ($T_{Evaluate} = Q_{out_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate} = Q_{in_DRX}$) specified in Table 7.6.2.2-2 will be used.

When eDRX_CONN cycle is used, the Q_{out} evaluation period ($T_{Evaluate}Q_{out_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate}Q_{in_DRX}$) specified in Table 7.6.2.2-3 will be used.

When the UE creates autonomous gaps for identification the CGI of an E-UTRA intra-frequency cell or an E-UTRA inter-frequency cell and when higher-layer signalling indicates certain subframes for restricted radio link monitoring, the UE shall also perform radio link monitoring. In this case, the Q_{out} evaluation period ($T_{Evaluate}Q_{out_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate}Q_{in_DRX}$) specified in Table 7.6.2.2-2 will be used $T_{evaluate}$.

Note 1: This RLM requirement does not need to be tested.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate} = Q_{out_DRX}$ [s] period becomes worse than the threshold Q_{out} , Layer 1 of the UE shall send out-of-sync indication for the PCell or PSCell to the higher layers within $T_{Evaluate} = Q_{out_DRX}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate}$ _ Q_{in_DRX} [s] period becomes better than the threshold Q_{in} , Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate}$ _ Q_{in_DRX} [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell or PSCell shall be performed as specified in clause 4.2.1 in [3]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length). When the UE is configured with dual connectivity, then two successive indications from Layer 1 shall be separated by at least max(10 ms, MCG_DRX_cycle_length) for PCell and by at least max(10 ms, SCG_DRX_cycle_length) for PSCell. When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, eDRX_CONN cycle length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [2], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [2].

Table 7.6.2.2-1: Qout and Qin Evaluation Period in DRX

DRX cycle length (s)		T _{Evaluate} _Q _{out_DRX} and
		T _{Evaluate_} Q _{in_DRX} (s) (DRX cycles)
≤ 0.01		Non-DRX requirements in
		clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04		Note 1 (20)
0.04 < DRX cycle ≤ 0. 64		Note 1 (10)
0.64 < DRX cycle ≤ 2.56		Note 1 (5)
Note 1:	Note 1: Evaluation period length in time depends on the length of	
	the DRX cycle in use	
Note 2:		
evaluation and SCG's DRX configuration is applied for		
PSCell RLM evaluation		

Table 7.6.2.2-2: Q_{out} and Q_{in} Evaluation Period in DRX when higher-layer signalling restricted measurement resource

DRX cycle length (s)		T _{Evaluate} _Q _{out_DRX} and
		T _{Evaluate_} Q _{in_DRX} (s) (DRX cycles)
≤ 0.01		Non-DRX requirements in
		clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04		Note 1 (40)
0.04 < DRX cycle ≤ 0. 16		Note 1 (20)
0. 16 < DRX cycle ≤ 0.64		Note 1 (10)
0.64 < DRX cycle ≤ 2.56		Note 1 (5)
Note 1:	Note 1: Evaluation period length in time depends on the length of	
	the DRX cycle in use	
Note 2:	MCG's DRX configuration is applied for PCell RLM	
evaluation and SCG's DRX configuration is applied for		
PSCell RLM evaluation		

Table 7.6.2.2-3: \mathbf{Q}_{out} and \mathbf{Q}_{in} Evaluation Period when eDRX_CONN cycle is configured

eDRX_CONN cycle length [s]		T _{Evaluate} _Q _{out_DRX} and T _{Evaluate} _Q _{in_DRX} [s] (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤		Note (5)
10.24		
Note:	Note: Evaluation period length in time depends on the length of	
the eDRX_CONN cycle in use		

7.6.2.3 Minimum requirement at transitions

When the UE transitions between any two of DRX, eDRX_CONN and non-DRX or when DRX or eDRX_CONN cycle periodicity changes, for a duration of time equal to the evaluation period corresponding to the second mode after the transition occurs, the UE shall use an evaluation period that is no less than the minimum of evaluation periods corresponding to the first mode and the second mode. Subsequent to this duration, the UE shall use an evaluation period corresponding to the second mode. This requirement shall be applied to both out-of-sync evaluation and in-sync evaluation of the PCell and PSCell.

7.6.2.4 Minimum requirement during SI Acquisition with autonomous gaps

For E-UTRAN FDD-UTRAN FDD measurements with autonomous gaps, for identification of the CGI of a UTRA FDD cell (clause 8.1.2.4.17), the UE shall also perform radio link monitoring. In this case the out-of sync and in-sync evaluation periods can be longer than those defined in sections 7.6.2.1-7.6.2.3.

For E-UTRAN TDD-UTRAN FDD measurements with autonomous gaps, for identification of the CGI of a UTRA FDD cell (clause 8.1.2.4.18), the UE shall also perform radio link monitoring. In this case the out-of sync and in-sync evaluation periods can be longer than those defined in sections 7.6.2.1-7.6.2.3.

7.6.2.5 Minimum requirement under IDC Interference

When the UE is provided with IDC solution, the UE shall also perform radio link monitoring and meet the corresponding requirements in clause 7.6.2.

7.7 SCell Activation and Deactivation Delay for E-UTRA Carrier Aggregation

7.7.1 Introduction

This section defines requirements for the delay within which the UE shall be able to activate a deactivated SCell and deactive an activated SCell in E-UTRA carrier aggregation. The requirements are applicable to an E-UTRA carrier aggregation capable UE which has been configured with up to four downlink SCells.

If multiple downlink SCells are activated or deactivated in the same MAC control element as defined in [17], the requirements shall apply to each of the SCells in the MAC control element.

7.7.2 SCell Activation Delay Requirement for Deactivated SCell

The requirements in this section shall apply for the UE configured with one downlink SCell. The requirements in this section are applicable for E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD carrier aggregation.

The delay within which the UE shall be able to activate the deactivated SCell depends upon the specified conditions.

Upon receiving SCell activation command in subframe n, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [17] for the SCell being activated no later than in subframe n+24 provided the following conditions are met for the SCell:

- During the period equal to max(5 measCycleSCell, 5 DRX cycles) before the reception of the SCell activation command:
 - the UE has sent a valid measurement report for the SCell being activated and
 - the SCell being activated remains detectable according to the cell identification conditions specified in section 8.3.3.2,
- SCell being activated also remains detectable during the SCell activation delay according to the cell identification conditions specified in section 8.3.3.2.

Otherwise upon receiving the SCell activation command in subframe n, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [17] for the SCell being activated no later than in subframe n+34 provided the SCell can be successfully detected on the first attempt.

If there is no reference signal received for the CSI measurement over the delay corresponding to the minimum requirements specified above, then the UE shall report corresponding valid CSI for the activated SCell on the next available uplink reporting resource after receiving the reference signal.

If there are no uplink resources for reporting the valid CSI in subframe n+24 or n+34 then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The valid CSI is based on the UE measurement and corresponds to any CQI value specified in [3] with the exception of CQI index = 0 (out of range) provided:

- the conditions in section 7.7 are met over the entire SCell activation delay and
- the conditions for CQI reporting defined in Section 7.2.3 of [3] are met.

In addition to CSI reporting defined above, UE shall also apply other actions related to the activation command specified in [17] for an SCell at the first opportunities for the corresponding actions once the SCell is activated.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+9 when PCell belongs to E-UTRA FDD.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+11 when PCell belongs to E-UTRA TDD.

Starting from the subframe specified in section 4.3 of [3] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for the SCell.

7.7.3 SCell Deactivation Delay Requirement for Activated SCell

The requirements in this section shall apply for the UE configured with one downlink SCell. The requirements in this section are applicable for E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD carrier aggregation.

Upon receiving SCell deactivation command or upon expiry of the *sCellDeactivationTimer* in subframe n, the UE shall accomplish the deactivation actions specified in [17] for the SCell being deactivated no later than in subframe n+8.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+9 when PCell belongs to E-UTRA FDD.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+11 when PCell belongs to E-UTRA TDD.

7.7.4 SCell Activation Delay Requirement for Deactivated SCell with Muliple Downlnk SCells

The requirements in this section shall apply for the UE configured with up to four downlink SCells. The requirements in this section are applicable for E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD carrier aggregation.

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate total}$) according to the following expression:

$$T_{activate_total} = T_{activate_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

T_{activate total} is the total time to activate a SCell and is expressed in subframes.

T_{activate basic} is the SCell activation delay specified in section 7.7.2;

 K_i ($0 \le K_i \le [3]$) is the number of times the other i^{th} SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \le N \le 4$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+11 if:
 - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
 - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+9.

Starting from the subframe specified in section 4.3 of [3] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

7.7.5 SCell Deactivation Delay Requirement for Activated SCell with Multiple Downlink SCells

The requirements in this section shall apply for the UE configured with up to four downlink SCells. The requirements in this section are applicable for E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD carrier aggregation.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in section 7.7.3 regardless of whether any other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
 - the PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
 - the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+9.

7.7.6 SCell Activation Delay Requirement for Deactivated PUCCH SCell

The requirements in this section shall apply for the UE configured with one downlink SCell and when PUCCH is configured for the SCell being activated.

If the UE has a valid TA for transmitting on an SCell then the UE shall be able to transmit valid CSI report and apply actions related to the SCell activation command as specified in [17] for the SCell being activated on the PUCCH SCell no later than in subframe n+ $T_{activate basic}$:

Where:

- A TA is considered to be valid provided that the *TimeAlignmentTimer* [2] assocated with the TAG containing the PUCCH SCell is running.
- T_{activate_basic} is the SCell activation delay as defined in section 7.7.2.

If the UE does not have a valid TA for transmitting on an SCell then the UE shall be capable to perform downlink actions related to the SCell activation command as specified in [17] for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{\text{activate_basic}}$ and shall be capable to perform uplink actions related to the SCell activation command as specified in [17] for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{\text{delay_PUCCH SCell}}$ and shall transmit valid CSI report for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{\text{delay_PUCCH SCell}}$, where:

$$T_{delay_PUCCH\ SCell} = T_{activate_basic} + T_1 + T_2 + T_3$$

Where:

- T₁ is the delay uncertainty in acquiring the first available PRACH occasion in the PUCCH SCell. T1 is up to 25 subframes and the actual value of T₁ shall depend upon the PRACH configuration used in the PUCCH SCell.
- T₂ is the delay for obtaining a valid TA command for the sTAG to which the SCell configured with PUCCH belongs. T₂ is up to 13 subframes.
- T_3 is the delay for applying the received TA for upling transmission. T_3 is 6 subframes.

The above delay requirement ($T_{delay_PUCCH\ SCell}$) shall apply provided that:

- The UE has received a PDCCH order to initiate RA procedure on the PUCCH SCell within T_{activate_basic} otherwise additional delay to activate the SCell is expected; and

- The RA on PUCCH SCell is not interrupted by the RA on PCell otherwise additional delay to activate the SCell is expected.

The interruption on the PCell specified in section 7.8.2 shall meed all applicable requirements in clause 7.7.2.

7.7.7 SCell Activation Delay Requirement for Deactivated PUCCH SCell with Multiple SCells

The requirements in this section shall apply for the UE configured with up to four downlink SCells and when PUCCH is configured for the SCell being activated.

If the UE has a valid TA for transmitting on a PUCCH SCell then the UE shall be able to transmit valid CSI report and apply actions related to the SCell activation command as specified in [17] for the SCell being activated on the PUCCH SCell no later than in subframe n+ $T_{activate total}$:

Where:

- A TA is considered to be valid provided that the *TimeAlignmentTimer* [2] assocated with the TAG containing the PUCCH SCell is running.
- T_{activate_total} is the SCell activation delay as defined in section 7.7.4.

If the UE does not have a valid TA for transmitting on an SCell then the UE shall be capable to perform downlink actions related to the SCell activation command as specified in [17] for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{\text{activate_basic}}$ and shall be capable to perform uplink actions related to the SCell activation command as specified in [17] for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{\text{delay_PUCCH_multiple_SCells}}$ and shall transmit valid CSI report for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{\text{delay_PUCCH_multiple_SCells}}$, where:

$$T_{delay\ PUCCH\ multiple\ SCells} = T_{activate\ total} + T_1 + T_2 + T_3$$

Where:

- T_1 , T_2 and T_3 are defined in section 7.7.6

The above delay requirement ($T_{delay_PUCCH_multiple_SCells}$) shall apply provided that:

- The UE has received a PDCCH order to initiate RA procedure on the PUCCH SCell within T_{activate_basic} otherwise additional delay to activate the SCell is expected; and
- The RA on PUCCH SCell is not interrupted by the RA on PCell otherwise additional delay to activate the SCell is expected.

The interruption on the PCell and/or on the activated SCell specified in section 7.8.2 shall meed all applicable requirements in clause 7.7.4.

7.7.8 SCell Deactivation Delay Requirement for Activated PUCCH SCell

The requirements in this section shall apply for the UE configured with one downlink SCell and when PUCCH is configured for the SCell being activated.

The UE shall deactivate a SCell configured with PUCCH and meet the SCell deactivation delay requirements specified in section 7.7.3.

The interruption on the PCell specified in section 7.8.2 shall meed all applicable requirements in clause 7.7.3.

7.7.9 SCell Deactivation Delay Requirement for Activated PUCCH SCell with Multiple SCells

The requirements in this section shall apply for the UE configured with up to four downlink SCells and when PUCCH is configured for the SCell being deactivated.

The UE shall deactivate a SCell configured with PUCCH and meet the SCell deactivation delay requirements specified in section 7.7.5.

The interruption on the PCell and/or on the activated SCell specified in section 7.8.2 shall meed all applicable requirements in clause 7.7.5.

7.7.10 SCell Activation Delay Requirement for Deactivated SCell under Frame Structure 3

The requirements in this section shall apply for E-UTRA carrier aggregation of one FDD PCell or one TDD PCell and one SCell following the frame structure type 3 [16].

The delay within which the UE shall be able to activate the deactivated SCell depends upon the specified conditions.

Upon receiving SCell activation command in subframe n, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [17] for the SCell being activated no later than in subframe $n+T_{\text{activate basic FS3}}$, provided the following conditions are met for the SCell:

- During the period equal to max(5 measCycleSCell, 5 DRX cycles) before the reception of the SCell activation command:
 - the UE has sent a valid measurement report for the SCell being activated and
 - the SCell being activated remains detectable according to the cell identification conditions specified in section 8.3.3.2,
- SCell being activated also remains detectable during the SCell activation delay according to the cell identification conditions specified in section 8.3.3.2.

$$T_{activate_basic_FS3} = 16 \text{ ms} + T_{DMTC_duration} + (L+2) * T_{DMTC_periodicity}$$
, where

 $T_{DMTC duration} = 6$ ms is the DMTC duration [2],

 $T_{DMTC_periodicity}$ is the periodicity of the DMTC [2],

Otherwise upon receiving the SCell activation command in subframe n, the UE shall be capable to transmit a valid CSI report and apply actions related to the activation command as specified in [17] for the SCell being activated no later than in subframe $n+T_{\text{activate_basic_FS3}}$, provided the SCell can be successfully detected on the first attempt. In this case, Tactivate_basic_FS3 is defined as follows.

$$T_{activate\ basic\ FS3} = 16\ ms + T_{DMTC\ duration} + (L+3) * T_{DMTC\ periodicity}$$
, where

 $T_{DMTC duration} = 6$ ms is the DMTC duration [2],

T_{DMTC_periodicity} is the periodicity of the DMTC [2],

L is the number of times the discovery signal occasion is not available at the UE during the SCell activation time.

If there is no reference signal received for the CSI measurement over the delay corresponding to the minimum requirements specified above, then the UE shall report corresponding valid CSI for the activated SCell on the next available uplink reporting resource after receiving the reference signal.

If there are no uplink resources for reporting the valid CSI in subframe $n+T_{activate_basic_FS3}$ then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The valid CSI is based on the UE measurement and corresponds to any CQI value specified in [3] with the exception of CQI index = 0 (out of range) provided:

- the conditions in section 7.7 are met over the entire SCell activation delay and
- the conditions for CQI reporting defined in Section 7.2.3 of [3] are met.

In addition to CSI reporting defined above, UE shall also apply other actions related to the activation command specified in [17] for an SCell at the first opportunities for the corresponding actions once the SCell is activated.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+9 when PCell belongs to E-UTRA FDD.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+11 when PCell belongs to E-UTRA TDD.

Starting from the subframe specified in Section 4.3 of [3] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE has available uplink resources to report for the SCell.

7.7.11 SCell Deactivation Delay Requirement for Activated SCell under Frame Structure 3

The requirements in this section shall apply for the UE configured with one downlink SCell. The requirements in this section shall apply for E-UTRA carrier aggregation of one FDD PCell or one TDD PCell and the SCell following the frame structure type 3 [16].

Upon receiving SCell deactivation command or upon expiry of the *sCellDeactivationTimer* in subframe n, the UE shall accomplish the deactivation actions specified in [17] for the SCell being deactivated no later than in subframe n+8.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+9 when PCell belongs to E-UTRA FDD.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+11 when PCell belongs to E-UTRA TDD.

7.7.12 SCell Activation Delay Requirement for Deactivated SCell with Multiple Downlink SCells under Frame Structure 3

The requirements in this section shall apply for the UE configured with two or three downlink SCells. The requirements in this section shall apply for E-UTRA carrier aggregation of one FDD PCell or one TDD PCell and all the SCells following the frame structure type 3 [16].

While activating a SCell, if any other SCell is activated, deactivated, configured or deconfigured by the UE, the UE shall meet the SCell activation delay requirements ($T_{activate_total_FS3}$) according to the following expression:

$$T_{activate_total_FS3} = T_{activate_basic_FS3} + T_{DMTC_periodicity} \times \sum_{i=1}^{N-1} K_i$$

where

T_{activate total FS3} is the total time to activate a SCell and is expressed in subframes,

T_{activate basic FS3} is the SCell activation delay for the SCell, as specified in section 7.7.10,

T_{DMTC_periodicity} is the periodicity of the DMTC [2],

 K_i ($0 \le K_i \le [3]$) is the number of times the other i^{th} SCell is activated, deactivated, configured or deconfigured while the SCell is being activated,

N ($2 \le N \le 3$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+9 when PCell belongs to E-UTRA FDD.
- The interruption on the PCell and/or on the activated SCell specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+11 when PCell belongs to E-UTRA TDD.

Starting from the subframe specified in section 4.3 of [3] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE has available uplink resources to report for the SCell being activated.

7.7.13 SCell Deactivation Delay Requirement for Activated SCell with Multiple Downlink SCells under Frame Structure 3

The requirements in this section shall apply for the UE configured with two or three downlink SCells. The requirements in this section shall apply for E-UTRA carrier aggregation of one FDD PCell or one TDD PCell and all the SCells following the frame structure type 3 [16].

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in section 7.7.11 regardless of whether any other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+9 when PCell belongs to E-UTRA FDD.
- The interruption on the PCell and/or on the activated SCell specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe n+11 when PCell belongs to E-UTRA TDD.

7.8 Interruptions with Carrier Aggregation

7.8.1 Introduction

This section contains the requirements related to the interruptions on PCell and activated SCell if configured, when up to four SCells are configured, deconfigured, activated or deactivated. The respective requirements in Section 7.8 shall apply for:

- E-UTRA FDD CA,
- E-UTRA TDD CA,
- E-UTRA TDD-FDD CA,
- inter-band CA where PCell is FDD or TDD and all the SCells are following the frame structure type 3 [16].

Note: interruptions at SCell addition/release, activation/deactivation and during measurements on SCC may not be required by all UEs.

Editor's Note: The interruptions shall not interrupt RRC signalling or ACK/NACKs related to RRC reconfiguration procedure [2] for SCell addition/release or MAC control signalling [17] for SCell activation/deactivation command. How to specify this is FFS.

7.8.2 Requirements

7.8.2.1 Interruptions at SCell addition/release for intra-band CA

When an intra-band SCell is added or released as defined in [2] the UE is allowed an interruption of up to 5 subframes on PCell during the RRC reconfiguration procedure [2]. This interruption is for both uplink and downlink of PCell.

7.8.2.2 Interruptions at SCell addition/release for inter-band CA

When an inter-band SCell is added or released as defined in [2] the UE that requires interruption is allowed an interruption of up to 1 subframe on PCell during the RRC reconfiguration procedure [2]. This interruption is for both uplink and downlink of PCell.

7.8.2.3 Interruptions at SCell activation/deactivation for intra-band CA

When an intra-band SCell is activated or deactivated as defined in [17] the UE is allowed an interruption of up to 5 subframes on PCell during the activation/deactivation delay defined in Section 7.7. This interruption is for both uplink and downlink of PCell.

7.8.2.4 Interruptions at SCell activation/deactivation for inter-band CA

When an inter-band SCell is activated or deactivated as defined in [17] the UE that requires interruption is allowed an interruption of up to 1 subframe on PCell during the activation/deactivation delay defined in Section 7.7. This interruption is for both uplink and downlink of PCell.

7.8.2.5 Interruptions during measurements on SCC for intra-band CA

PCell interruptions due to measurements on SCC when the SCell is deactivated are allowed with up to 0.5% probability of missed ACK/NACK when the configured *measCycleSCell* [2] is 640 ms or longer.

If indicated by the network using IE *allowInterruptions* [2], PCell interruptions due to measurements on SCC when the SCell is deactivated are allowed with up to 0.5% probability of missed ACK/NACK regardless of the configured *measCycleSCell* [2].

Each interruption shall not exceed 5 subframes.

7.8.2.6 Interruptions during measurements on SCC for inter-band CA

PCell interruptions due to measurements on SCC when the SCell is deactivated are allowed with up to 0.5% probability of missed ACK/NACK when the configured *measCycleSCell* [2] is 640 ms or longer.

If indicated by the network using IE *allowInterruptions* [2], PCell interruptions due to measurements on SCC when the SCell is deactivated are allowed with up to 0.5% probability of missed ACK/NACK regardless of the configured *measCycleSCell* [2].

Each interruption shall not exceed 1 subframe.

7.8.2.7 Interruptions at SCell addition/release with multiple downlink SCells

When any number of SCells between one and four is added or released using the same *RRCConnectionReconfiguration* message as defined in [2], the UE is allowed an interruption on PCell and on any activated SCell during the RRC reconfiguration procedure as follows:

- an interruption on PCell:
 - of up to 1 subframe, if the PCell is not in the same band as any of the SCells being added or released, or
 - of up to 5 subframes, if the PCell is in the same band as any of the SCells being added or released;
- an interruption on any activated SCell:
 - of up to 1 subframe, if the activated SCell is not in the same band as any of the SCells being added or released, or
 - of up to 5 subframes, if the activated SCell is in the same band as any of the SCells being added or released.

7.8.2.8 Interruptions at SCell activation/deactivation with multiple downlink SCells

When any number of SCells between one and four is activated or deactivated using the same MAC control element as defined in [17], the UE is allowed an interruption on PCell and on any activated SCell during the SCell activation/deactivation procedure [17] as follows:

- an interruption on PCell:
 - of up to 1 subframe, if the PCell is not in the same band as any of the SCells being activated or deactivated, or
 - of up to 5 subframes, if the PCell is in the same band as any of the SCells being activated or deactivated;
- an interruption on any activated SCell:
 - of up to 1 subframe, if the activated SCell is not in the same band as any of the SCells being activated or deactivated, or

- of up to 5 subframes, if the activated SCell is in the same band as any of the SCells being activated or deactivated.

7.8.2.9 Interruptions during measurements on SCC with multiple downlink SCells

If one SCell is deactivated, the UE is allowed due to measurements on the SCC with deactivated SCell:

- an interruption on PCell with up to 0.5% probability of missed ACK/NACK when the configured *measCycleSCell* [2] for the deactivated SCell is 640 ms or longer.
- an interruption on PCell with up to 0.5% probability of missed ACK/NACK regardless of the configured *measCycleSCell* [2] for the deactivated SCell if indicated by the network using IE *allowInterruptions* [2],

Each interruption shall not exceed:

- 1 subframes if the PCell is not in the same band as the deactivated SCell
- 5 subframes if the PCell is in the same band as the deactivated SCell
- an interruption on any activated SCell with up to 0.5% probability of missed ACK/NACK when the configured *measCycleSCell* [2] for the deactivated SCell is 640 ms or longer .
- an interruption on any activated SCell with up to 0.5% probability of missed ACK/NACK regardless of the configured *measCycleSCell* [2] for the deactivated SCell if indicated by the network using IE *allowInterruptions* [2].

Each interruption shall not exceed:

- 1 subframes if the activated SCell is not in the same band as the deactivated SCell
- 5 subframes if the activated SCell is in the same band as the deactivated SCell

If two, three, or four SCells are deactivated, the UE is allowed due to measurements on the SCCs with deactivated SCells:

- an interruption on PCell with up to 0.5% probability of missed ACK/NACK when any of the configured *measCycleSCell* [2] for the deactivated SCells is 640 ms or longer.
- an interruption on PCell with up to 0.5% probability of missed ACK/NACK regardless of the configured *measCycleSCell* [2] for the deactivated SCells if indicated by the network using IE *allowInterruptions* [2].
- an interruption on an activated SCell with up to 0.5% probability of missed ACK/NACK when any of the configured *measCycleSCell* [2] for the deactivated SCells is 640 ms or longer.
- an interruption on an activated SCell with up to 0.5% probability of missed ACK/NACK regardless of the configured *measCycleSCell* [2] for the deactivated SCells if indicated by the network using IE *allowInterruptions* [2].

Each interruption on the PCell shall not exceed:

- 1 subframes if the PCell is not in the same band as any of the deactivated SCells
- 5 subframes if the PCell is in the same band as any of the deactivated SCells

Each interruption on the activated Cell shall not exceed:

- 1 subframe if the activated SCell is not in the same band as any of the deactivated SCells
- 5 subframes if the the activated SCell is in the same band as any of the deactivated SCells

7.8.2.10 Interruptions at overlapping addition/release/activation/deactivation of SCells

If a UE is commanded by the network to sequentially add/release/activate/deactivate SCells, and a new procedure of addition/release/activation/deactivation of SCell(s) takes place before the completion of previous procedure of addition/release/activation/deactivation of SCell(s), the interruptions on PCell due to sequential addition/release/activation/deactivation of SCells shall not exceed the sum of the allowed interruptions on the PCell

caused by each of the addition/release/activation/deactivation procedures, and the interruptions on already activated SCell due to sequential addition/release/activation/deactivation of SCells shall not exceed the sum of the allowed interruptions on the SCell caused by each of the addition/release/activation/deactivation procedures, as defined in above sections.

7.8.2.11 Interruptions during RSSI measurements on one SCC under Frame Structure 3

The requirements in this section apply for inter-band CA where PCell belongs to FDD or TDD and all the configured SCells belong to the frame structure type 3 [16], and the UE is configured with one SCell.

PCell interruptions due to RSSI measurements on SCC when the SCell is deactivated are allowed with up to 0.5% probability of missed ACK/NACK when any of the configured *rmtc-Period* [2] and *measCycleSCell* [2] is 640 ms or longer.

Each allowed interruption on the PCell shall not exceed 1 subframe.

7.8.2.12 Interruptions during RSSI measurements on multiple SCCs under Frame Structure 3

The requirements in this section apply for inter-band CA where PCell belongs to FDD or TDD and all the configured SCells belong to the frame structure type 3 [16], and the UE is configured with up to four SCells.

If one SCell is deactivated,

- the UE is allowed due to RSSI measurements on the SCC with deactivated SCell:
 - an interruption on PCell with up to 0.5% probability of missed ACK/NACK when any of the configured *rmtc-Period* [2] and the configured *measCycleSCell* [2] for the deactivated SCell is 640 ms or longer,
 - an interruption on any activated SCell with up to 0.5% probability of missed ACK/NACK when any of the configured *rmtc-Period* [2] and the configured *measCycleSCell* [2] for the deactivated SCell is 640 ms or longer.
- no interruption is allowed if both of the configured *rmtc-Period* [2] and the configured *measCycleSCell* [2] for the deactivated SCell are below 640 ms.

If two, three, or four SCells are deactivated,

- the UE is allowed due to RSSI measurements on the SCCs with deactivated SCells:
 - an interruption on PCell with up to 0.5% probability of missed ACK/NACK when:
 - any of the configured *rmtc-Period* [2] and the configured *measCycleSCell* [2] for the deactivated SCells is 640 ms or longer, or
 - RSSI windows with the length of *measDuration* [2] for at least some of the SCCs with the deactivated SCells within their respective *rmtc-Period* [2] are not within [20] ms;
 - an interruption on an activated SCell with up to 0.5% probability of missed ACK/NACK when:
 - any of the configured *rmtc-Period* [2] and the configured and the configured *measCycleSCell* [2] for the deactivated SCells is 640 ms or longer, or
 - RSSI windows with the length of *measDuration* [2] for at least some of the SCCs with the deactivated SCells within their respective *rmtc-Period* [2] are not within [20] ms.
- no interruption is allowed if both of the configured *rmtc-Period* [2] and the configured *measCycleSCell* [2] for the deactivated SCell are below 640 ms and RSSI windows with the length of *measDuration* [2] for all the SCCs with the deactivated SCells within their respective *rmtc-Period* [2] are within [20] ms.

Each allowed interruption shall not exceed:

- 1 subframe on the PCell, and
- 5 subframes on the activated SCell.

7.9 Maximum Transmission Timing Difference in Carrier Aggregation

7.9.1 Introduction

A UE shall be capable of handling a relative received time difference between the PCell and SCell to be aggregated in inter-band CA and intra-band non-contiguous CA.

7.9.2 Minimum Requirements for Interband Carrier Aggregation

The UE shall be capable of handling at least a relative received time difference between the signals received from the PCell and the SCell at the UE receiver of up to 30.26 µs when one SCell is configured.

When two, three, or four SCells are configured, the UE shall be capable of handling at least a relative propagation delay difference between the signals received from any pair of the serving cells (PCell and the SCells) at the UE receiver of up to 30.26 µs.

The UE shall be capable of handling a maximum uplink transmission timing difference between the pTAG and the sTAG of at least 32.47µs provided that the UE is:

- configured with inter-band CA and
- configured with the pTAG and the sTAG,

A UE configured with pTAG and sTAG may stop transmitting on the SCell if after timing adjusting due to received TA command the uplink transmission timing difference between PCell and SCell exceeds the maximum value the UE can handle as specified above.

The UE shall be capable of handling a maximum uplink transmission timing difference between the pTAG and any of the two sTAGs or between the two sTAGs of at least 32.47µs provided that the UE is:

- configured with inter-band CA and
- configured with the two sTAGs,

A UE configured with two sTAGs may stop transmitting on the SCell if after timing adjusting due to received TA command the uplink transmission timing difference between SCell in one sTAG and SCell in other sTAG exceeds the maximum value the UE can handle as specified above.

7.9.3 Minimum Requirements for Intraband non-contiguous Carrier Aggregation

The UE shall be capable of handling at least a relative received time difference between the signals received from the PCell and the SCell at the UE receiver of up to $30.26 \,\mu s$.

The UE shall be capable of handling a maximum uplink transmission timing difference between the pTAG and the sTAG of at least $32.47\mu s$ provided that the UE is:

- configured with intra-band non-contiguous CA and
- configured with the pTAG and the sTAG,

A UE configured with pTAG and sTAG may stop transmitting on the SCell if after timing adjusting due to received TA command the uplink transmission timing difference between PCell and SCell exceeds the maximum value the UE can handle as specified above.

7.9.4 Minimum Requirements for Inter-Band Carrier Aggregation under Frame Structure 3

The requirements in this section shall apply for E-UTRA inter-band carrier aggregation of one FDD PCell or one TDD PCell and the SCell(s) following the frame structure type 3 [16].

The UE shall be capable of handling at least a relative received time difference between the signals received from the PCell and the SCell at the UE receiver of up to 30.26 µs when one SCell is configured.

When two or three SCells are configured, the UE shall be capable of handling at least a relative propagation delay difference between the signals received from any pair of the serving cells (PCell and the SCells) at the UE receiver of up to $30.26 \,\mu s$.

7.10 Interruptions with RSTD Measurements with Carrier Aggregation

7.10.1 Introduction

This section contains the requirements related to the interruptions on PCell and activated SCell if configured, when performing RSTD measurements on cells belonging to at least one SCC with deactivated SCell.

Note: Interruptions during RSTD measurements on PCell and activated SCell if configured may not be required by all UEs.

7.10.2 Requirements

When common DRX is used, no interruption is allowed for all carrier aggregation configurations while the On Duration timer is running.

The interruption requirement considers only missed ACK/NACK due to reconfiguration of the receiver bandwidth, and not due to other causes such as RF impairments or channel conditions.

7.10.2.1 Interruptions during RSTD measurements on SCC for intra-band CA with one downlink SCell

PCell interruptions due to RSTD measurements on SCC when the SCell is deactivated are allowed with up to 0.5% probability of missed ACK/NACK when the the PRS periodicity $T_{\rm PRS}$ is 640 ms or longer. Each interruption shall not exceed 5 subframes.

7.10.2.2 Interruptions during RSTD measurements on SCC for inter-band CA with one downlink SCell

PCell interruptions due to RSTD measurements on SCC when the SCell is deactivated are allowed with up to 0.5% probability of missed ACK/NACK when the PRS periodicity $T_{\rm PRS}$ is 640 ms or longer. Each interruption shall not exceed 1 subframe.

7.10.2.3 Interruptions during RSTD measurements on SCC with multiple downlink SCells

If one SCell is activated and the other SCell is deactivated, then due to RSTD measurements on the SCC with deactivated SCell the UE is allowed:

- ullet an interruption on PCell with up to 0.5% probability of missed ACK/NACK when when the PRS periodicity $T_{\rm PRS}$ is 640 ms or longer. Each interruption shall not exceed:
 - o 1 subframe if the PCell is not in the same band as the deactivated SCell
 - o 5 subframes if the PCell is in the same band as the deactivated SCell
- an interruption on the activated SCell with up to 0.5% probability of missed ACK/NACK when the PRS periodicity $T_{\rm PRS}$ is 640 ms or longer. Each interruption shall not exceed:

- o 1 subframe if the activated SCell is not in the same band as the deactivated SCell
- o 5 subframes if the activated SCell is in the same band as the deactivated SCell

If both SCells are deactivated, then due to RSTD measurements on one or both SCCs with deactivated SCells the UE is allowed:

- an interruption on PCell with up to 1.0% probability of missed ACK/NACK when the configure PRS periodicity $T_{\rm PRS}$ is 640 ms or longer in any of the SCCs. Each interruption shall not exceed:
 - o 1 subframe if the PCell is not in the same band as any of the deactivated SCells
 - o 5 subframes if the PCell is in the same band as any of the deactivated SCells

7.10.2.4 Interruptions at overlapping RSTD and inter-frequency measurements

If the UE is configured for RSTD measurements on cells belonging to a SCC with deactivated SCell(s) and also with a *measCycleSCell* for performing E-UTRA carrier aggregation measurements as defined in Section 8.3 on the same SCC as configured for the RSTD measurements, then the total allowed interruption on the active serving cell(s) is the maximum of the interruption due to E-UTRA carrier aggregation measurements specified in Section 7. 8 and the interruption due to the RSTD measurements on SCC specified in this Section.

7.11 Radio Link Monitoring for UE Category 0

7.11.1 Introduction

The UE category 0 applicability of the requirements for performing radio link monitoring in subclause 7.11 is defined in Section 3.6.1.

The UE shall monitor the downlink link quality based on the cell-specific reference signal in order to detect the downlink radio link quality of the PCell as specified in [3].

The UE shall estimate the downlink radio link quality and compare it to the thresholds Q_{out_Cat0} and Q_{in_Cat0} for the purpose of monitoring downlink radio link quality of the PCell.

The threshold Q_{out_Cat0} is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to 10% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.11.1-1.

The threshold Q_{in_Cat0} is defined as the level at which the downlink radio link quality can be significantly more reliably received than at \bar{Q}_{out_Cat0} and shall correspond to 2% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.11.1-2.

Table 7.11.1-1 PDCCH/PCFICH transmission parameters for out-of-sync for UE category 0

Attribute	Value	
DCI format	1A	
Number of control OFDM symbols	2; Bandwidth ≥ 10 MHz	
	3; 3 MHz ≤ Bandwidth < 10 MHz	
	4; Bandwidth = 1.4 MHz	
Aggregation level (CCE)	4; Bandwidth = 1.4 MHz	
	8; Bandwidth ≥ 3 MHz	
Ratio of PDCCH RE energy to average RS RE energy	4 dB; when single antenna port is used for cell-specific reference signal transmission by the PCell. 4 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the PCell.	
Ratio of PCFICH RE energy to average RS RE energy	4 dB; when single antenna port is used for cell-specific reference signal transmission by the PCell. 1 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the PCell.	
Note 1: DCI format 1A is defined in clause 5.3.3.1.3 in TS 36.212 [21]. Note 2: A hypothetical PCFICH transmission corresponding to the number of control symbols shall be assumed.		

Table 7.11.1-2 PDCCH/PCFICH transmission parameters for in-sync for UE category 0

Attribute	Value	
DCI format	1C	
Number of control OFDM symbols	2; Bandwidth ≥ 10 MHz	
	3; 3 MHz ≤ Bandwidth < 10 MHz	
	4; Bandwidth = 1.4 MHz	
Aggregation level (CCE)	4	
Ratio of PDCCH RE energy to	1 dB; when single antenna port is used for cell-	
average RS RE energy	specific reference signal transmission by the	
	PCell.	
	1 dB; when two or four antenna ports are used	
for cell-specific reference signal trans		
	the PCell.	
Ratio of PCFICH RE energy to 4 dB; when single antenna port is used		
average RS RE energy	specific reference signal transmission by the	
	PCell.	
1 dB: when two or four antenna ports are		
for cell-specific reference signal transmission		
	the PCell.	
	in clause 5.3.3.1.4 in TS 36.212 [21].	
Note 2: A hypothetical PCFICH transmission corresponding to the number of		
control symbols shall be assumed.		

7.11.2 Requirements for FD-FDD and TDD

7.11.2.1 Minimum requirement when no DRX is used

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0} , Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0} , Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

7.11.2.2 Minimum requirement when DRX is used

When DRX is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate}_Q_{out_DRX_Cat0}$) and the Q_{in_Cat0} evaluation period ($T_{Evaluate}_Q_{in_DRX_Cat0}$) specified in Table 7.11.2.2-1 will be used.

When eDRX_CONN is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate}$ Q_{out_DRX} Cat0) and the Q_{in} Cat0 evaluation period ($T_{Evaluate}$ Q_{in} DRX Cat0) specified in Table 7.11.2.2-2 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}$ _ $Q_{out_DRX_Cat0}$ [s] period becomes worse than the threshold Q_{out_Cat0} , Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate}$ _ $Q_{out_DRX_Cat0}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}$ _Q_{in_DRX_Cat0} [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate}$ _Q_{in_DRX_Cat0} [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [2], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

Table 7.11.2.2-1: Q_{out} and Q_{in} Evaluation Period in DRX for FD-FDD and TDD UE category 0

DRX cycle length (s)	T _{Evaluate} _Q _{out_DRX_Cat0} and T _{Evaluate} _Q _{in_DRX_Cat0} (s) (DRX cycles)	
≤ 0.01	Non-DRX requirements in	
	clause 7.11.2.1 are applicable.	
0.01 < DRX cycle ≤0.04 Note (20)		
0.04 < DRX cycle ≤ 0. 64 Note (10)		
0.64 < DRX cycle ≤ 2.56	Note (5)	
Note: Evaluation period length in time depends on the length of the DRX cycle in use		

Table 7.11.2.2-2: Q_{out} and Q_{in} Evaluation Period for FD-FDD and TDD UE category 0 when eDRX_CONN cycle is used

eDRX	_CONN cycle length [s]	T _{Evaluate} _Q _{out_DRX_Cat0} and T _{Evaluate} _Q _{in_DRX_Cat0} [s] (eDRX_CONN cycles)	
2.56 <	eDRX_CONN cycle ≤	Note (5)	
	10.24		
Note:	Note: Evaluation period length in time depends on the length of		
	the eDRX_CONN cycle in use		

7.11.2.3 Minimum requirement at transitions

When the UE transitions between any two of DRX, eDRX_CONN, and non-DRX or when DRX or eDRX_CONN cycle periodicity changes, for a duration of time equal to the evaluation period corresponding to the second mode after the transition occurs, the UE shall use an evaluation period that is no less than the minimum of evaluation periods corresponding to the first mode and the second mode. Subsequent to this duration, the UE shall use an evaluation period corresponding to the second mode. This requirement shall be applied to both out-of-sync evaluation and in-sync evaluation of the PCell.

7.11.3 Requirements for HD-FDD

7.11.3.1 Minimum requirement when no DRX is used

The HD-FDD category 0 UE shall meet all applicable requirements specified in clause 7.11.2.1 under the following conditions

- at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_Cat0} and Q_{out_Cat0} evaluation periods.

7.11.3.2 Minimum requirement when DRX is used

When DRX is used for HD-FDD category 0 UEs, the Q_{out} evaluation period ($T_{Evaluate} = Q_{out} = Q_{out} = Q_{out} = Q_{out}$) and the Q_{in} evaluation period ($T_{Evaluate} = Q_{in} = Q_{in} = Q_{out} = Q_$

When eDRX_CONN is used for HD-FDD category 0 UEs, the Q_{out} evaluation period ($T_{Evaluate}Q_{out_DRX_Cat0}$) and the Q_{in} evaluation period ($T_{Evaluate}Q_{in_DRX_Cat0}$) specified in Table 7.11.3.2-2 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}$ _ $Q_{out_DRX_Cat0}$ [s] period becomes worse than the threshold Q_{out_Cat0} , Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate}$ _ $Q_{out_DRX_Cat0}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last $T_{\text{Evaluate}} = Q_{\text{in_DRX}_\text{Cat0}}$ [s] period becomes better than the threshold $Q_{\text{in_Cat0}}$, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{\text{Evaluate}} = Q_{\text{in_DRX}_\text{Cat0}}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [2], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

Table 7.11.3.2-1: Qout and Qin Evaluation Period in DRX for HD-FDD UE category 0

DRX cycle length (s)	T _{Evaluate} _Q _{out_DRX} and T _{Evaluate} _Q _{in_DRX} (s) (DRX cycles)	
≤ 0.01	Non-DRX requirements in	
	clause 7.11.2.1 are applicable.	
0.01 < DRX cycle ≤0.04	Note (40)	
0.04 < DRX cycle ≤ 0. 16	Note (20)	
0. 16 < DRX cycle ≤ 0.64 Note (10)		
0.64 < DRX cycle ≤ 2.56	64 < DRX cycle ≤ 2.56 Note (5)	
Note: Evaluation period length in time depends on the length of		
the DRX cycle in use		

Table 7.11.3.2-2: Q_{out} and Q_{in} Evaluation Period for HD-FDD UE category 0 when eDRX_CONN cycle is used

eDRX_CONN cycle length [s]		T _{Evaluate_} Q _{out_DRX} and T _{Evaluate_} Q _{in_DRX} [s] (eDRX_CONN cycles)	
2.56 < eDRX_CONN cycle ≤ 10.24		Note (5)	
Note: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use			

7.11.3.3 Minimum requirement at transitions

The minimum requirements at transitions defined in clause 7.11.2.3 also apply for this section under the following conditions:

at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_Cat0} and Q_{out_Cat0} evaluation periods.

7.12 Interruptions with Dual Connectivity

7.12.1 Introduction

This section contains the requirements related to the interruptions on PCell, PSCell, and SCell, when

PSCell is added or released, or

transitions between active and non-active during DRX, or

transitions from non-DRX to DRX, or

SCell in either MCG or SCG is added or released, or

SCell in either MCG or SCG is activated or deactivated, or

measurements on SCC with deactivated SCell in either MCG or SCG.

The requirements shall apply for E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD dual connectivity.

7.12.2 Requirements

7.12.2.1 Interruptions at PSCell addition/release

When a PSCell is added or released as defined in [2] the UE is allowed an interruption of up to 1 subframe on PCell and the activated SCell in MCG if configured during the RRC reconfiguration procedure [2] in synchronous dual connectivity. This interruption is for both uplink and downlink of PCell.

The UE is allowed an interruption of up to 2 subframes on PCell and the activated SCell in MCG if configured during the RRC reconfiguration procedure [2] in asynchronous dual connectivity. This interruption is for both uplink and downlink of PCell.

7.12.2.2 Interruptions at transitions between active and non-active during DRX

When PCell is in non-DRX and PSCell is in DRX, interruptions on PCell and the activated SCell in MCG if configured due to transitions from active to non-active and from non-active to active during PSCell DRX are allowed with up to 1% probability of missed ACK/NACK when the configured PSCell DRX cycle is less than 640 ms, and 0.625% probability of missed ACK/NACK is allowed when the configured PSCell DRX cycle is 640 ms or longer. Each interruption shall not exceed 1 subframe.

When PSCell is in non-DRX and PCell is in DRX, interruptions on PSCell on the activated SCell in SCG if configured due to transitions from active to non-active and from non-active to active during PCell DRX are allowed with up to 1 % probability of missed ACK/NACK when the configured PCell DRX cycle is less than 640 ms, and 0.625% probability of missed ACK/NACK is allowed when the configured PCell DRX cycle is 640 ms or longer. Each interruption shall not exceed 1 subframe.

When both PCell and PSCell are in DRX, no interruption is allowed.

7.12.2.3 Interruptions at transitions from non-DRX to DRX

Interruption on PCell and the activated SCell in MCG if configured due to PSCell transitions from non-DRX to DRX when PCell is in non-DRX shall not exceed 1subframe.

Interruption on PSCell and the activated SCell in SCG if configured due to PCell transitions from non-DRX to DRX when PSCell is in non-DRX shall not exceed 1subframe.

7.12.2.4 Interruptions at SCell addition/release

The requirements in this clause shall apply for the UE configured with PSCell.

In synchronous dual connectivity, when one SCell is added or released as defined in [2]:

- an interruption on PCell shall meet requirements in clause 7.8.2.7,
- an interruption on PSCell shall meet requirements in clause 7.8.2.7, where the term PCell in clause 7.8.2.7 shall be deemed to be replaced with PSCell.

In asynchronous dual connectivity, when one SCell belonging to MCG is added or released as defined in [2]:

- an interruption on PCell shall meet requirements in clause 7.8.2.7,
- an interruption on PSCell shall meet requirements in clause 7.8.2.7 except for the number of subframe, where the term PCell in clause 7.8.2.7 shall be deemed to be replaced with PSCell. The UE is allowed an interruption on PSCell of up to 2 subframes.

In asynchronous dual connectivity, when one SCell belonging to SCG is added or released as defined in [2]:

- an interruption on PCell shall meet requirements in clause 7.8.2.7 except for the number of subframe. The UE is allowed an interruption on PCell of up to 2 subframes.
- an interruption on PSCell shall meet requirements in clause 7.8.2.7, where the term PCell in clause 7.8.2.7 shall be deemed to be replaced with PSCell.

7.12.2.5 Interruptions at SCell activation/deactivation

The requirements in this clause shall apply for the UE configured with PSCell and one SCell.

In synchronous dual connectivity, when one SCell is activated or deactivated as defined in [17]:

- an interruption on PCell shall meet requirements in clause 7.8.2.8,
- an interruption on PSCell shall meet requirements in clause 7.8.2.8, where the term PCell in clause 7.8.2.8 shall be deemed to be replaced with PSCell.

In asynchronous dual connectivity, when one SCell belonging to MCG is activated or deactivated as defined in [17]:

- an interruption on PCell shall meet requirements in clause 7.8.2.8,
- an interruption on PSCell shall meet requirements in clause 7.8.2.8 except for the number of subframe, where the term PCell in clause 7.8.2.8 shall be deemed to be replaced with PSCell. The UE is allowed an interruption on PSCell of up to 2 subframes.

In asynchronous dual connectivity, when one SCell belonging to SCG is activated or deactivated as defined in [17]:

- an interruption on PCell shall meet requirements in clause 7.8.2.8 except for the number of subframe. The UE is allowed an interruption on PCell of up to 2 subframes,
- an interruption on PSCell shall meet requirements in clause 7.8.2.8, where the term PCell in clause 7.8.2.8 shall be deemed to be replaced with PSCell.

7.12.2.6 Interruptions during measurements on SCC

The requirements in this clause shall apply for the UE configured with PSCell and one SCell.

In synchronous dual connectivity, when one SCell is deactivated, the UE is allowed due to measurements on the SCC with the deactivated SCell:

- an interruption on PCell shall meet requirements in clause 7.8.2.9,
- an interruption on PSCell shall meet requirements in clause 7.8.2.9, where the term PCell in clause 7.8.2.8 shall be deemed to be replaced with PSCell.

In asynchronous dual connectivity, when one SCell belonging to MCG is deactivated, the UE is allowed due to measurements on the SCC with the deactivated SCell:

- an interruption on PCell shall meet requirements in clause 7.8.2.9,
- an interruption on PSCell shall meet requirements in clause 7.8.2.9 except for the number of subframe, where the term PCell in clause 7.8.2.9 shall be deemed to be replaced with PSCell. The UE is allowed an interruption on PSCell of up to 2 subframes.

In asynchronous dual connectivity, when one SCell belonging to SCG is deactivated, the UE is allowed due to measurements on the SCC with the deactivated SCell:

- an interruption on PCell shall meet requirements in clause 7.8.2.9 except for the number of subframe. The UE is allowed an interruption on PCell of up to 2 subframes
- an interruption on PSCell shall meet requirements in clause 7.8.2.9, where the term PCell in clause 7.8.2.9 shall be deemed to be replaced with PSCell.

7.13 Cell phase synchronization accuracy (Synchronized mode of dual connectivity)

7.13.1 Definition

Cell phase synchronization accuracy is defined as the maximum absolute timing mismatch between subframes which are transmitted by MeNB and SeNB and are scheduled for the same UE. The cell phase synchronization accuracy is defined only for synchronized mode of dual connectivity operation.

7.13.2 Minimum requirements

The cell phase synchronization accuracy shall not exceed the sum of absolute timing accuracy values declared by the manufacturer(s) for each BS. The cell phase synchronization accuracy requirement is optional.

NOTE: The sum of absolute timing accuracy values in synchronized mode of dual connectivity is assumed to be related to MRTD according to the following inequality:

 $T_{CPSA} + T_{RPTD} \le MRTD$ at the UE

Where:

T_{CPSA} is the sum of absolute timing accuracy values declared by the manufacturer(s).

T_{RPTD} is the absolute propagation time difference between MeNB and SeNB, which serve the same UE.

MRTD is the Maximum Received Timing Difference at the UE. MRTD is equal to 33 µs.

7.14 PSCell Addition and Release Delay for E-UTRA Dual Connectivity

7.14.1 Introduction

This section defines requirements for the delay within which the UE shall be able to configure a PSCell in E-UTRA dual connectivity. The requirements are applicable to an E-UTRA dual connectivity capable UE. The requirements shall apply for E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD dual connectivity.

7.14.2 PSCell Addition Delay Requirement

The requirements in this section shall apply for the UE configured with only PCell.

Upon receiving PSCell addition in subframe n, the UE shall be capable to transmit PRACH preamble towards PSCell no later than in subframe n+ T_{config} PSCell:

Where:

$$T_{config_PSCell} = 20ms + T_{activation_time} + 50ms + T_{PCell_DU} + T_{PSCell_DU}$$

 $T_{activation_time}$ is the PSCell activation delay. If the PSCell is known, then $T_{activation_time}$ is 20ms. If the PSCell is unknown, then $T_{activation_time}$ is 30ms provided the PSCell can be successfully detected on the first attempt.

 T_{PCell_DU} is the delay uncertainty due to PCell PRACH preamble transmission. T_{PCell_DU} is up to 20ms if PSCell activation is interrupted by a PCell PRACH preamble transmission, otherwise it is 0.

 T_{PSCell_DU} is the delay uncertainty in acquiring the first available PRACH occasion in the PSCell. T_{PSCell_DU} is up to 30ms.

PSCell is known if it has been meeting the following conditions:

During the last [5] seconds before the reception of the PSCell configuration command:

- the UE has sent a valid measurement report for the PSCell being configured and
- the PSCell being configured remains detectable according to the cell identification conditions specified in section 8.8,
- PSCell being configured also remains detectable during the PSCell configuration delay according to the cell identification conditions specified in section 8.8.

otherwise it is unknown. The PCell interruption specified in section 7.12 is allowed only during the RRC reconfiguration procedure [2].

7.14.3 PSCell Release Delay Requirement

The requirements in this section shall apply for a UE configured with PCell and one PSCell.

Upon receiving PSCell release in subframe n, the UE shall accomplish the release actions specified in [2] no later than in subframe n+20.

The PCell interruption specified in section 7.12 is allowed only during the RRC reconfiguration procedure [2].

7.15 Maximum Receive Timing Difference in Dual Connectivity

7.15.1 Introduction

A UE shall be capable of handling a relative receive timing difference between subframe timing boundaries of the PCell and PSCell to be aggregated for E-UTRA FDD-FDD, E-UTRA-TDD-TDD, E-UTRA TDD-FDD dual connectivity.

7.15.2 Minimum Requirements for Inter-band Dual Connectivity

The UE shall be capable of handling at least a relative receive timing difference between the subframe timing of the signals received from a cell belonging to the MCG and a cell belonging to the SCG at the UE receiver of up to 33 μ s provided the UE indicates that it is capable of synchronous dual connectivity [2]. The requirements for synchronous dual connectivity are only applicable for TDD-TDD, FDD-FDD, and TDD-FDD inter-band dual connectivity.

The UE shall be capable of handling at least a relative receive timing difference between the subframe timing of the signals received from a cell belonging to the MCG and a cell belonging to the SCG at the UE receiver of up of $500 \,\mu s$ provided the UE indicates that it is capable of asynchronous dual connectivity [2]. The requirements for asynchronous dual connectivity are only applicable for FDD-FDD inter-band dual connectivity.

The UE shall be capable of handling a relative receive timing difference between the subframe timing of the signals received from any pair of the serving cells belonging to the same cell group according to the requirements in clause 7.9.2.

7.16 Proximity-based Services

7.16.1 Introduction

The requirements in this clause are applicable for UE performing transmissions and/or reception for ProSe Direct Discovery and/or ProSe Direct Communication in both RRC_IDLE and RRC_CONNECTED state.

7.16.2 Requirements

7.16.2.1 ProSe UE transmission timing

For ProSe transmission of sidelink channels and signals, UE shall have the capability to follow the timing change of the reference synchronization source.

7.16.2.1.1 Serving cell or PCell as timing reference

The requirements in this subclause are applicable when the reference timing used for ProSe transmissions is the serving cell (RRC_IDLE) or PCell (RRC_CONNECTED). The sidelink transmissions takes place $(N_{TA,SL} + N_{TA \text{ offset}}) \cdot T_s$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell, where $N_{TA \text{ offset}}$ is specified in Section 8.1 of [16]. The value of $N_{TA,SL}$ differs between sidelink channels and signals, and is either $N_{TA,SL} = N_{TA}$ or $N_{TA,SL} = 0$ as specified in Section 9.9 of [16].

7.16.2.1.1.1 Requirements when $N_{TA,SL} = 0$

For ProSe transmission of sidelink channels and signals employing $N_{\text{TA,SL}} = 0$, the requirements in Section 7.1 as specified for PRACH transmissions shall apply.

7.16.2.1.1.2 Requirements when $N_{TA,SL} = N_{TA}$

For ProSe transmission of sidelink channels and signals while employing $N_{\rm TA,SL} = N_{\rm TA}$, the requirements in Section 7.1 as specified for PUSCH shall apply.

When it is the first sidelink transmission in a DRX cycle, the requirements in Section 7.1 as specified for the first PUSCH transmission in a DRX cycle shall apply. The reference point for the UE initial transmit timing control requirement shall be $(N_{\text{TA},\text{SL_ref}} + N_{\text{TA offset}}) \cdot T_{\text{s}}$ seconds before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell. $(N_{\text{TA},\text{SL_ref}} + N_{\text{TA offset}})$ (in T_{s} units) for sidelink transmissions is the difference between UE transmission timing and the downlink timing immediately after when the last timing advance in Section 7.3 was applied.

When it is not the first sidelink transmission in a DRX cycle or there is no DRX cycle, the requirements as specified in Section 7.1 for PUSCH transmissions when the PUSCH transmission is not the first transmissions in a DRX cycle shall apply.

7.16.2.1.2 SCell or non-serving cell as timing reference

The requirements in this subclause are applicable when the reference timing used for ProSe transmissions is either a SCell (RRC_CONNECTED) or a non-serving cell selected on a non-serving ProSe carrier (RRC_IDLE or RRC_CONNECTED).

The transmission timing requirements are as specified in subclause 7.16.2.1.1, with reference cell as either the SCell or the selected non-serving cell.

7.16.3 Interruptions with ProSe

This section contains the requirements related to the interruptions on PCell and activated SCell(s) due ProSe Direct Discovery and ProSe Direct Communication. When ProSe is on a serving cell frequency, then the requirements in this subclause are applicable only to ProSe on E-UTRA FDD bands. When ProSe is on non-serving frequency, then the requirements are applicable to ProSe on both E-UTRA FDD and TDD bands.

When a UE capable of ProSe Direct Communication and/or ProSe Direct Discovery is configured with DRX and DRX is in use, interruptions specified in this section are not allowed while the *onDurationTimer*[17] is running.

7.16.3.1 Interruptions at ProSe Direct Discovery configuration

A UE capable of ProSe Direct Discovery may indicate its interest (initiation or termination) in ProSe Direct Discovery to the connected eNodeB using IE *SidelinkUEInformation* [2].

The UE is allowed an interruption of up to 1 subframe on PCell and on any activated SCell during the RRC reconfiguration procedure that includes the ProSe Direct Discovery configuration message *sl-DiscConfig* [2] (setup and release). This interruption is for both uplink and downlink of PCell and activated SCell(s).

7.16.3.2 Interruptions at ProSe Direct Communication configuration

A UE capable of ProSe Direct Communication may indicate its interest (initiation or termination) in ProSe Direct Communication to the connected eNodeB using IE *SidelinkUEInformation* [2].

The UE is allowed an interruption of up to 1 subframe on PCell and on any activated SCell during the RRC reconfiguration procedure that includes the ProSe Direct Communication configuration message *sl-CommConfig* [2] (setup and release). This interruption is for both uplink and downlink of PCell and activated SCell(s).

7.16.3.3 Interruptions during ProSe Direct Discovery

When ProSe Direct Discovery operation is on a serving cell (PCell/SCell) and when no request for transmission and/or reception gaps are signalled by the ProSe UE, the UE is allowed an interruption of up to 1 subframe that is *N* subframes before and after a UL subframe configured for ProSe Direct Discovery by a serving eNodeB. For discovery period less than 320ms, the allowed interruptions are additionally limited up to 0.625%.

The value of N is ceil(w1/1ms) subframes when the parameter discSyncWindow[2] is configured with value w1 in the sidelink synchronization resource configuration associated with the ProSe Direct Discovery subframe.

The value of N is 1 subframe otherwise.

When ProSe Direct Discovery is on a non-serving carrier, and when no request for transmission and/or reception gaps is signalled by the UE, interruptions to serving cell(s) is allowed with up to $min\left(0.5\%, \frac{6}{discPertod(ms)} \times 100\%\right)$ probability of missed ACK/NACK.

The interruptions are for both uplink and downlink of PCell on any activated SCell. The interruption for the ProSe UE may occur:

- while switching a receiver chain ON/OFF for ProSe Direct Discovery if the UE has a dedicated receiver chain for discovery, and/or
- while switching a transmitter chain ON/OFF for ProSe Direct Discovery transmissions on a non-serving carrier, and if the UE has a dedicated transmitted chain for discovery.

7.16.3.4 Interruptions during ProSe Direct Discovery with discovery gaps

When ProSe Direct Discovery is either on a serving cell (PCell/SCell) or a non-serving frequency, and when discovery reception and/or transmission gaps are configured by the serving cell, then only the following interruptions to the PCell and any activated SCell(s) are allowed:

- Uplink interruption is allowed on a subframe configured as downlink reception gap (using *discRxGapConfig*) if either the subframe immediately preceding or immediately following that subframe is not configured as reception gap; and,
- If ProSe Direct Discovery is on a non-serving FDD carrier and that carrier is used for ProSe synchronization, then uplink interruption is additionally allowed on 1 subframe in a discovery period. The interrupted subframe(s) shall be within the subframes configured as reception gap using *discRxGapConfig*; and,
- If ProSe Direct Discovery transmissions are on carrier that is not configured for uplink, then UE is allowed to additionally interrupt the serving cell(s) on up to 2 subframes for each discovery/SLSS transmission configured in a discovery period. The interrupted subframe(s) shall be within the subframes configured as transmission gaps using discTxGapConfig.

NOTE: The request and grant of discovery gaps is left up to UE and eNodeB implementations, respectively. When ProSe Direct Discovery is on a non-serving carrier and that carrier is used for ProSe synchronization, then the UE requested / eNodeB configured gaps may depend if inter-frequency measurements are additionally configured for that non-serving frequency.

7.16.3.5 Interruptions during ProSe Direct Communication

When ProSe Direct Communication is on a non-serving carrier and the PCell is not broadcasting SIB18, then interruptions to serving cell(s) is allowed with up to 0.5% probability of missed ACK/NACK.

The interruptions are for both uplink and downlink of PCell on any activated SCell.

7.16.4 Cell reselection for ProSe Direct Discovery on non-serving frequency

The requirements in this subclause apply when ProSe Direct Discovery transmissions are configured on a non-serving carrier and that non-serving carrier is used for downlink synchronziation and measurements for ProSe Direct Discovery transmission, and provided the parameters required for cell selection / reselection are provided by the serving cell using discCellSelectionInfo.

NOTE: The requirements do not apply if the UE is required to acquire the cell selection/reselection parameters that are broadcast from the concerned cell for evaluation.

If the UE signals request for transmission and/or reception gaps, then the requirements apply if the gaps are configured as requested by the UE.

7.16.4.1 Measurement and evaluation of selected cell

The UE shall measure the RSRP and RSRQ level of the selected reference cell on the non-serving carrier used for ProSe Direct Discovery synchronization and evaluate the cell selection criterion S defined in [1] for the selected cell at least every discovery period.

The UE shall filter the RSRP and RSRQ measurements of the selected cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by, at least discPeriod / 2.

7.16.4.2 Measurement of intra-frequency E-UTRAN cells

The UE shall be able to identify new intra-frequency cells on the non-serving carrier used for ProSe Direct Discovery transmission and perform RSRP and RSRQ measurements of identified intra-frequency cells.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS36.304 [1, 11.4] within $T_{\text{detect}, \text{EUTRAN_ProSe_Intra}}$ when $T_{\text{reselection}} = 0$ (within discCellSelectionInfo). An intra frequency cell is considered to be detectable according to RSRP, RSRP $\hat{\text{Es}}/\text{Iot}$, SCH_RP and SCH $\hat{\text{Es}}/\text{Iot}$ defined in Annex B.1.1 for a corresponding Band.

The UE shall measure RSRP and RSRQ at least every T_{measure,EUTRAN_ProSe_Intra} (see table 7.16.4.2-1) for intra-frequency cells that are identified and measured according to the measurement rules.

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

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined [1] within $T_{\text{evaluate,E-UTRAN_ProSe_Intra}}$ when $T_{\text{reselection}} = 0$ (within discCellSelectionInfo) as specified in table 7.16.4.2-1 provided that the cell is at least 3dB better ranked. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both the non-serving cell that is currently selected and the non-serving cell being reselected to for ProSe Direct Discovery synchronization.

If $T_{reselection}$ timer (within discCellSelectionInfo) has a non-zero value and the intra-frequency cell being reselected to is better ranked than the currently selected reference cell, the UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

Discovery Period [s]	T _{detect,EUTRAN_ProSe_Intra} (number of discovery periods)	T _{measure,EUTRAN_ProSe_Intra} (number of discovery periods)	T _{evaluate,E-UTRAN_ProSe_Intra} (number of discovery periods)
Discovery Period≤0.32	Note 1 (36)	Note 1 (4)	Note 1 (16)
0.32 <discovery period≤0.64<="" td=""><td>Note 1 (28)</td><td>Note 1 (2)</td><td>Note 1 (8)</td></discovery>	Note 1 (28)	Note 1 (2)	Note 1 (8)
0.64 <discovery (1)="" (25)="" (5)<="" 1="" note="" period≤1.28="" td=""></discovery>			
1.28 <discovery period≤10.24<="" td=""><td>Note 1 (23)</td><td>Note 1 (1)</td><td>Note 1 (3)</td></discovery>	Note 1 (23)	Note 1 (1)	Note 1 (3)
NOTE 1: Time depends upon the configured Discovery period.			

Table 7.16.4.2-1: T_{detect,EUTRAN_ProSe_Intra}, T_{measure,EUTRAN_ProSe_Intra} and T_{evaluate, E-UTRAN_ProSe_Intra}

7.16.5 Selection / Reselection of ProSe relay UE

This subclause contains the requirements related to selection and reselection of ProSe relay UE if the serving frequency is used for ProSe Direct Communication via a ProSe relay UE.

For a remote UE configured by upper layer for relay operation, when the RSRP measurement of the serving cell (RRC_IDLE) or the PCell (RRC_CONNECTED) is below *threshHigh* (within *remoteUE-Config*), the remote UE shall search for candidate relay UEs for selection and/or reselection every discovery period.

If the remote UE has a selected sidelink relay UE, then the remote UE shall measure the SD-RSRP of the selected relay once in every four discovery periods and evaluate if it meets the relay selection criterion as defined in [TS 36.331, 5.10.11.4].

The remote UE shall measure SD-RSRP of the candidate relay UEs every $T_{measure,\ ProSe_Relay_Intra}$ for intra-frequency relay UEs that are detected and measured according to the measurement rules.

For an intra-frequency relay UEs that are detected, but that has not been selected or reselected to, the remote UE shall be capable of evaluating that the intra-frequency relay UE has met selection or reselection criterion defined in [2, 5.10.11.4] within $T_{\text{evaluate,ProSe_Relay_Intra}}$ as specified in table 7.16.5-1.

The minimum requirements are required to meet when the selected and candidate relay UEs are transmitting relay discovery message every discovery period.

Table 7.16.5-1: T_{measure, ProSe_Relay_Intra} and T_{evaluate, ProSe_Relay_intra}

Discovery Period [s]	T _{measure,ProSe_Relay_Intra} [s] (number of discovery periods)	T _{evaluate, ProSe_Relay_intra} [s] (number of discovery periods)
0.04≤Discovery period≤10.24	Note 1 (4)	Note 1 (16)
NOTE 1: Time depends upon the configured Discovery period.		

7.17 Maximum Transmission Timing Difference in Dual Connectivity

7.17.1 Introduction

A UE shall be capable of handling a relative transmission timing difference between subframe timing boundaries of the PCell and PSCell to be aggregated for E-UTRA FDD-FDD, E-UTRA-TDD-TDD, E-UTRA TDD-FDD dual connectivity.

7.17.2 Minimum Requirements for maximum transmission timing difference Inter-band Dual Connectivity

The UE shall be capable of handling a maximum uplink transmission timing difference between PCell and PSCell of at least $35.21~\mu s$ provided the UE indicates that it is capable of synchronous dual connectivity [2]. The requirements for synchronous dual connectivity are only applicable for TDD-TDD, FDD-FDD, and TDD-FDD inter-band dual connectivity.

The UE shall be capable of handling a maximum uplink transmission timing difference between PCell and PSCell of at least 500 µs provided the UE indicates that it is capable of asynchronous dual connectivity [2]. The requirements for asynchronous dual connectivity are only applicable for FDD-FDD and inter-band dual connectivity.

If the UE is configured with higher layer parameter powerControlMode<1>, then the UE may stop transmission on the PSCell if the UL transmission timing difference exceeds $35.21\mu s$. If a UE supports both synchronous and asynchronous dual connectivity and if the UE is configured with higher layer parameter powerControlMode<2>, then the UE needs to constitute new subframes pair if the UL transmission timing difference exceeds $500\mu s$.7.18 SCell Activation and Deactivation Delay for E-UTRA Dual Connectivity

7.18.1 Introduction

This section defines requirements for the delay within which the UE shall be able to activate a deactivated SCell and deactive an activated SCell in E-UTRA dual connectivity. The requirements are applicable to an E-UTRA dual connectivity capable UE which has been configured with one SCell in either MCG or SCG and PSCell. In case where the SCell belongs to SCG, the term PCell in clause 7.7 shall be replaced with PSCell. The requirements shall apply for E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD dual connectivity.

7.18.2 SCell Activation Delay Requirement for Deactivated SCell

The requirements in this clause shall apply for a UE configured with PSCell and one SCell.

The SCell activation delay shall meet the requirements in clause 7.7.2.

7.18.3 SCell Deactivation Delay Requirement for Activated SCell

The requirements in this clause shall apply for a UE configured with PSCell and one SCell.

The SCell deactivation delay shall meet the requirements in clause 7.7.3.

7.19 Radio Link Monitoring for UE Category M1

7.19.1 Introduction

The UE category M1 applicability of the requirements for performing radio link monitoring in subclause 7.19 is defined in Section 3.1.

The UE shall monitor the downlink link quality based on the cell-specific reference signal in order to detect the downlink radio link quality of the PCell as specified in [3].

7.19.2 Requirements for FD-FDD and TDD CE mode A

The requirements defined in this subclause 7.19.2 for performing radio link monitoring are applicable for UE category M1 defined in Section 3.1.

The UE shall estimate the downlink radio link quality and compare it to the thresholds $Q_{out_Cat\ M1}$ and $Q_{in_Cat\ M1}$ for the purpose of monitoring downlink radio link quality of the PCell.

The threshold $Q_{out_Cat\ M1}$ is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to 10% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.19.2-1.

The threshold $Q_{in_Cat\ M1}$ is defined as the level at which the downlink radio link quality can be significantly more reliably received than at $Q_{out_Cat\ M1}$ and shall correspond to 2% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.19.2-1.

Table 7.19.2-1 M-PDCCH transmission parameters for out-of-sync and in-sync for UE category M1 with CE mode A

Attribute	Out-of-sync	In-sync
DCI format	6-1A	6-1A
Starting OFDM symbols	2; Bandwidth >= 10MHz	2; Bandwidth >= 10MHz
	3; 3MHz <= Bandwidth < 10MHz	3; 3MHz <= Bandwidth < 10MHz
	4; Bandwidth = 1.4MHz	4; Bandwidth = 1.4MHz
Maximum M-PDCCH repetition level	R ^{Note1}	R/2 Note1
Aggregation level (ECCE)	[24]	[8]
M-PDCCH Transmission type	Distributed	Distributed
NOTE 1: R is a configurable parameter defined in 36.331 and R>1.		

7.19.2.1 Minimum requirement when no DRX is used

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1} , Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1} , Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

7.19.2.2 Minimum requirement when DRX is used

When DRX is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate_}Q_{out_DRX_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate_}Q_{in_DRX_CatM1}$) is specified in Table 7.19.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}Q_{out_DRX_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1} , Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate}Q_{out_DRX_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}$ _ $Q_{in_DRX_CatM1}$ [s] period becomes better than the threshold Q_{in_CatM1} , Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate}$ _ $Q_{in_DRX_CatM1}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [2], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

Table 7.19.2.2-1: Qout and Qin Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	T _{Evaluate} _Q _{out_DRX_CatM1} and T _{Evaluate} _Q _{in_DRX_CatM1} (s) (DRX cycles)	
≤ 0.01	Non-DRX requirements in	
	clause 7.19.2.1 are applicable.	
0.01 < DRX cycle ≤0.04 Note (20)		
0.04 < DRX cycle ≤ 0. 64 Note (10)		
0.64 < DRX cycle ≤ 2.56 Note (5)		
NOTE: Evaluation period length in time depends on the length of		
the DRX cycle in use		

7.19.2.3 Minimum requirement at transitions

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

When the UE transitions between DRX and non-DRX or when DRX cycle periodicity changes, for a duration of time equal to the evaluation period corresponding to the second mode after the transition occurs, the UE shall use an evaluation period that is no less than the minimum of evaluation periods corresponding to the first mode and the second mode. Subsequent to this duration, the UE shall use an evaluation period corresponding to the second mode. This requirement shall be applied to both out-of-sync evaluation and in-sync evaluation of the PCell.

7.19.3 Requirements for HD-FDD with CE mode A

The requirements defined in this subclause 7.19.3 for performing radio link monitoring are applicable for UE category M1 defined in Section 3.1.

7.19.3.1 Minimum requirement when no DRX is used

The HD-FDD category M1 with CE mode A UE shall meet all applicable requirements specified in clause 7.19.2.1 under the following conditions

- at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_CatM1} and Q_{out_CatM1} evaluation periods.

7.19.3.2 Minimum requirement when DRX is used

When DRX is used for HD-FDD category M1 with CE mode A UEs, the Q_{out} evaluation period ($T_{Evaluate}Q_{out_DRX_CatM1}$) and the Q_{in} evaluation period ($T_{Evaluate}Q_{in_DRX_CatM1}$) specified in Table 7.19.3.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}Q_{out_DRX_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1} , Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate}Q_{out_DRX_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}$ _ $Q_{in_DRX_CatM1}$ [s] period becomes better than the threshold Q_{in_CatM1} , Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate}$ _ $Q_{in_DRX_CatM1}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [2], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

Table 7.19.3.2-1: Qout and Qin Evaluation Period in DRX for HD-FDD UE category M1 with CE mode A

DRX cycle length (s)	T _{Evaluate} _Q _{out_DRX_M1} and T _{Evaluate} _Q _{in_DRX_M1} (s) (DRX cycles	
≤ 0.01	Non-DRX requirements in	
	clause 7.19.2.1 are applicable.	
0.01 < DRX cycle ≤0.04 Note (40)		
0.04 < DRX cycle ≤ 0. 16 Note (20)		
0. 16 < DRX cycle ≤ 0.64 Note (10)		
0.64 < DRX cycle ≤ 2.56 Note (5)		
Note: Evaluation period length in time depends on the length of		
the DRX cycle in use		

7.19.3.3 Minimum requirement at transitions

The minimum requirements at transitions defined in clause 7.19.2.3 also apply for this section under the following conditions:

- at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_CatM1} and Q_{out_CatM1} evaluation periods.

7.19.4 Requirements for FD-FDD and TDD with CE mode B

The requirements defined in this subclause 7.19.4 for performing radio link monitoring are applicable for UE category M1 defined in Section 3.1.

The UE shall estimate the downlink radio link quality and compare it to the thresholds $Q_{out_Cat\ M1}$ and $Q_{in_Cat\ M1}$ for the purpose of monitoring downlink radio link quality of the PCell.

The threshold $Q_{\text{out_Cat M1}}$ is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to 10% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.19.4-1.

The threshold $Q_{in_Cat\ M1}$ is defined as the level at which the downlink radio link quality can be significantly more reliably received than at $Q_{out_Cat\ M1}$ and shall correspond to 2% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.19.4-1.

Table 7.19.4-1 M-PDCCH transmission parameters for out-of-sync and in-sync for UE category M1 with CE mode B

Attribute	Out-of-sync	In-sync	
DCI format	6-1B	6-1B	
Starting OFDM symbols	2; Bandwidth >= 10MHz	2; Bandwidth >= 10MHz	
	3; 3MHz <= Bandwidth < 10MHz	3; 3MHz <= Bandwidth < 10MHz	
	4; Bandwidth = 1.4MHz	4; Bandwidth = 1.4MHz	
Maximum M-PDCCH repetition level R ^{Note1} R/2 ^{Note1}			
Aggregation level (ECCE) [24] [24]			
M-PDCCH Transmission type Distributed Distributed			
NOTE 1: R is a configurable parameter defined in 36.331 and R>1.			
NOTE 2: L∈ {24, [16], [8]}. The numers in the squarebrackets are to be confirmed.			

7.19.4.1 Minimum requirement when no DRX is used

When the downlink radio link quality of the PCell estimated over the last 4000 ms period becomes worse than the threshold Q_{out_CatM1} , Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 4000 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last 2000 ms period becomes better than the threshold Q_{in_CatM1} , Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 2000 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

7.19.4.2 Minimum requirement when DRX is used

When DRX is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate_}Q_{out_DRX_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate_}Q_{in_DRX_CatM1}$) is specified in Table 7.19.4.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}Q_{out_DRX_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1} , Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate}Q_{out_DRX_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}$ [s] period becomes better than the threshold Q_{in_CatM1} , Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [2], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

Table 7.19.4.2-1: Qout and Qin Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	T _{Evaluate} _Q _{out_DRX_CatM1} and T _{Evaluate} _Q _{in_DRX_CatM1} (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in
	clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period length in time depends on the length of	
the DRX cycle in use	-

7.19.2.4 Minimum requirement at transitions

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

When the UE transitions between DRX and non-DRX or when DRX cycle periodicity changes, for a duration of time equal to the evaluation period corresponding to the second mode after the transition occurs, the UE shall use an evaluation period that is no less than the minimum of evaluation periods corresponding to the first mode and the second mode. Subsequent to this duration, the UE shall use an evaluation period corresponding to the second mode. This requirement shall be applied to both out-of-sync evaluation and in-sync evaluation of the PCell.

7.19.5 Requirements for HD-FDD with CE mode B

The requirements defined in this subclause 7.19.5 for performing radio link monitoring are applicable for UE category M1 defined in Section 3.1.

7.19.5.1 Minimum requirement when no DRX is used

The HD-FDD category M1 with CE mode B UE shall meet all applicable requirements specified in clause 7.19.4.1 under the following conditions

- at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_CatM1} and Q_{out_CatM1} evaluation periods.

7.19.5.2 Minimum requirement when DRX is used

When DRX is used for HD-FDD category M1 with CE mode B UEs, the Q_{out} evaluation period ($T_{Evaluate}Q_{out_DRX_CatM1}$) and the Q_{in} evaluation period ($T_{Evaluate}Q_{in_DRX_CatM1}$) specified in Table 7.19.5.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}Q_{out_DRX_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1} , Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate}Q_{out_DRX_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}$ _ $Q_{in_DRX_CatM1}$ [s] period becomes better than the threshold Q_{in_CatM1} , Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate}$ _ $Q_{in_DRX_CatM1}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [2], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

Table 7.19.5.2-1: Qout and Qin Evaluation Period in DRX for HD-FDD UE category M1 with CE mode B

DRX cycle length (s)	T _{Evaluate} Q _{out_DRX_M1} and T _{Evaluate} Q _{in_DRX_M1} (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in
	clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (40)
0.04 < DRX cycle ≤ 0. 16	Note (20)
0. 16 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period	length in time depends on the length of
the DRX cycle in t	use

7.19.5.3 Minimum requirement at transitions

The minimum requirements at transitions defined in clause 7.19.2.3 also apply for this section under the following conditions:

at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_CatM1} and Q_{out_CatM1} evaluation periods.8 UE Measurements Procedures in RRC_CONNECTED State

8.1 General Measurement Requirements

8.1.1 Introduction

This clause contains requirements on the UE regarding measurement reporting in RRC_CONNECTED state. The requirements are split in E-UTRA intra frequency, E-UTRA inter frequency, Inter-RAT UTRA FDD, UTRA TDD and GSM measurements. These measurements may be used by the E-UTRAN, e.g. for handover decisions. The measurement quantities are defined in [4], the measurement model is defined in [22] and measurement accuracies are specified in clause 9. Control of measurement reporting is specified in TS 36.331 [2].

When the UE is provided with IDC solution, the UE shall also perform RRM measurements and meet the corresponding requirements in clause 8.

In the requirements of Section 8.1 for the UE capable of CA and the UE configured with up to four SCells, the applicable exceptions for side conditions are specified in Annex B, Sections B.4.2 and B.4.3, respectively.

In the requirements of Section 8.1 for the UE capable of DC and the UE configured with one PSCell, the applicable exceptions for side conditions are specified in Annex B, Sections B.4.2 and B.4.3, respectively.

The requirements in Section 9 are applicable for a UE performing measurements according to Section 8.1.

8.1.2 Requirements

8.1.2.1 UE measurement capability

If the UE requires measurement gaps to identify and measure inter-frequency and/or inter-RAT cells, in order for the requirements in the following subsections to apply the E-UTRAN must provide a single measurement gap pattern with constant gap duration for concurrent monitoring of all frequency layers and RATs.

During the measurement gaps the UE:

- shall not transmit any data

- is not expected to tune its receiver on any of the E-UTRAN carrier frequencies of PCell and any SCell.
- is not expected to tune its receiver on any of the E-UTRAN carrier frequencies of PCell, PSCell, and SCell.

If the UE supporting dual connectivity is configured with PSCell, during the total interruption time as shown in Figure 8.1.2.1-1, the UE shall not transmit and receive any data in SCG.

In the uplink subframe occurring immediately after the measurement gap,

- if the following conditions are met then it is up to UE implementation whether or not the UE can transmit data:
 - all the serving cells belong to E-UTRAN TDD;
 - if the subframe occurring immediately before the measurement gap is an uplink subframe.
- Otherwise the UE shall not transmit any data.

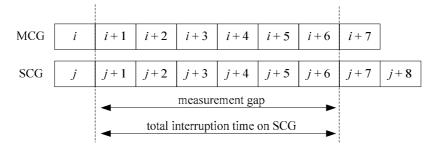
In determining the above UE behaviour in the uplink subframe occurring immediately after the measurement gap the UE shall treat a special subframe as an uplink subframe if the special subframe occurs immediately before the measurement gap, Inter-frequency and inter-RAT measurement requirements within this clause rely on the UE being configured with one measurement gap pattern unless the UE has signaled that it is capable of conducting such measurements without gaps. UEs shall only support those measurement gap patterns listed in Table 8.1.2.1-1 that are relevant to its measurement capabilities.

ProSe capable UE is allowed to perform ProSe transmissions during the measurement gaps that are not used for measurements if the requirements specified in section 8 for inter-frequency and inter-RAT measurements are fulfilled.

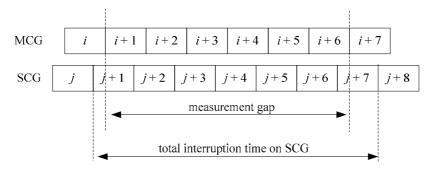
Gap Pattern Id	MeasurementGap Length (MGL, ms)	Measurement Gap Repetition Period (MGRP, ms)	Minimum available time for inter-frequency and inter-RAT measurements during 480ms period (Tinter1, ms)	Measurement Purpose
0	6	40	60	Inter-Frequency E-UTRAN FDD and TDD, UTRAN FDD, GERAN, LCR TDD, HRPD, CDMA2000 1x
1	6	80	30	Inter-Frequency E-UTRAN FDD and TDD, UTRAN FDD, GERAN, LCR TDD, HRPD, CDMA2000 1x

Table 8.1.2.1-1: Gap Pattern Configurations supported by the UE

- NOTE 1: When inter-frequency RSTD measurements are configured and the UE requires measurement gaps for performing such measurements, only Gap Pattern 0 can be used. For defining the inter-frequency and inter-RAT requirements T_{interl}=30ms shall be assumed.
- NOTE 2: A measurement gap starts at the end of the latest subframe occurring immediately before the measurement gap among MCG serving cells subframes.
- NOTE 3: MGL is the time from start of tuning to end of retuning, which is aligned between MCG and SCG.
- NOTE 4: The total interruption time on SCG is 6 subframes for synchronous dual connectivity, and the total interruption time on SCG is 7 subframes for asyncrhonous dual connectivity. As shown in Figure 8.1.2.1-1, MCG subframes from i+1 to i+6 are included in total interruption time together with SCG subframes from j+1 to j+6 for synchronous dual connectivity and j+1 to j+7 for asyncrhonous dual connectivity.
- NOTE 5: For asynchronous dual connectivity as shown in Figure 8.1.2.1-1 (b), subframe j is regarded as the subframe occurring immediately before the measurement gap for SCG, similarly, subframe j+8 is regarded as the subframe occurring immediately after the measurement gap for SCG.



(a) measurement GAP for synchronous dual connectivity



(b) measurement GAP for asynchronous dual connectivity

Figure 8.1.2.1-1: Measurement GAP and total interruption time on MCG and SCG

A UE that is capable of identifying and measuring inter-frequency and/or inter-RAT cells without gaps shall follow requirements as if Gap Pattern Id #0 had been used and the minimum available time Tinter1 of 60 ms shall be assumed for the corresponding requirements.

If the UE supporting E-UTRA carrier aggregation when configured with up to four SCCs is performing measurements on cells on PCC, inter-frequency measurements, or inter-RAT measurements, and interruption occurs on PCell or any activated SCell or both due to measurements performed on cells on an SCC with a deactivated SCell according to section 8.3, then the UE shall meet the requirements specified for each measurement in Section 8 and Section 9.

If the UE supporting E-UTRA dual connectivity when configured with a PSCell is performing measurements on cells on PCC, inter-frequency measurements, or inter-RAT measurements, then the UE shall meet the requirements specified for each measurement in Section 8 and Section 9.

A UE which indicate support for Increased UE carrier monitoring E-UTRA according to the capabilities in [2, 31] and which is capable of identifying and measuring inter-frequency and/or inter-RAT cells without gaps, shall be able to monitor maximum number of layers as defined in 8.1.2.1.1.1a, and apply the *MeasScaleFactor* [2] defining the relaxation to the requirements for the configured carriers according to section 8.1.2.1.1a.

8.1.2.1.1 Monitoring of multiple layers using gaps

When monitoring of multiple inter-frequency E-UTRAN and inter-RAT (UTRAN, GSM) using gaps (or without using gaps provided the UE supports such capability) is configured, the UE shall be capable of performing one measurement of the configured measurement type (RSRP, RSRQ, RSTD, UTRAN TDD P-CCPCH RSCP, UTRAN FDD CPICH measurements, GSM carrier RSSI, etc.) of detected cells on all the layers

The effective total number of frequencies excluding the frequencies of the PCell, SCells, and PSCell being monitored is N_{freq} , which is defined as:

$$N_{freq} = N_{freq, \; E\text{-}UTRA} + N_{freq, \; UTRA} + M_{gsm} + N_{freq, \; cdma2000} + N_{freq, \; HRPD}$$

where

 $N_{\text{freq, E-UTRA}}$ is the number of E-UTRA carriers being monitored (FDD and TDD)

N_{freq, UTRA} is the number of UTRA carriers being monitored (FDD and TDD)

 M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a MGRP of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil($N_{carriers,GSM}$ /20) where $N_{carriers,GSM}$ is the number of GSM carriers on which cells are being measured.

 $N_{\text{freq. cdma}2000}$ is the number of cdma2000 1x carriers being monitored.

N_{freq, HRPD} is the number of HRPD carriers being monitored.8.1.2.1.1.1 Maximum allowed layers for multiple monitoring

The UE shall be capable of monitoring at least per RAT group:

- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 1 FDD E-UTRA inter-frequency carrier for RSTD measurements, and
- Depending on UE capability, 3 TDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 1 TDD E-UTRA inter-frequency carrier for RSTD measurements, and
- Depending on UE capability, 3 FDD UTRA carriers, and
- Depending on UE capability, 3 TDD UTRA carriers, and
- Depending on UE capability, 32 GSM carriers (one GSM layer corresponds to 32 carriers), and
- Depending on UE capability, 5 cdma2000 1x carriers, and
- Depending on UE capability, 5 HRPD carriers

In addition to the requirements defined above, the UE shall be capable of monitoring a total of at least 7 effective carrier frequency layers comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 carriers), cdma2000 1x and HRPD layers.

8.1.2.1.1.1a Maximum allowed layers for multiple monitoring (Increased UE carrier monitoring)

UE which indicate support for Increased UE carrier monitoring E-UTRA according to the capabilities in [2,31] shall be capable of monitoring at least

- Depending on UE capability, 8 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 8 TDD E-UTRA inter-frequency carriers

UE which indicate support for increased UE carrier monitoring UTRA according to the capabilities in [2,31] shall be capable of monitoring at least

- Depending on UE capability, 6 FDD UTRA carriers, and
- Depending on UE capability, 7 TDD UTRA carriers, and

In addition to the requirements defined above, the UE which indicate support for Increased UE carrier monitoring E-UTRA or increased UE carrier monitoring UTRA according to the capabilities in [2,31]shall be capable of monitoring a total of at least 12 carrier frequency layers comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA TDD, UTRA TDD, GSM (one GSM layer corresponds to 32 carriers), cdma2000 1x and HRPD layers

The minimum performance requirements for a UE which does not indicate support for Increased UE carrier monitoring E-UTRA [2,31] are calculated assuming all E-UTRA carriers which the UE is required to monitor, are having normal performance, i.e. $N_{freq, E-UTRA, reduced} = 0$. The minimum performance requirements for a UE which does not indicate support for Increased UE carrier monitoring UTRA [2,31] are calculated assuming all UTRA carriers which the UE is required to monitor, are having normal performance, i.e. $N_{freq, UTRA, reduced} = 0$. Capabilities for number of carriers to monitor for UE which do not support increased carrier monitoring E-UTRA or increased carrier monitoring UTRA are specified in section 8.1.2.1.1.1. A UE which do not indicate support for Increased UE carrier monitoring E-UTRA or UTRAN [2,31] does not have any reduced performance carrier requirements and $K_n=1$.

8.1.2.1.1a Monitoring of multiple layers using gaps (Increased UE carrier monitoring)

For UE which support increased carrier monitoring E-UTRA or increased carrier monitoring UTRA, the measurement performance for different carriers may be configured by higher layers to be either normal or reduced performance. A measurement scaling factor, *MeasScaleFactor* [2], defining the relaxation to be applied to the requirements for carriers measured with reduced measurement performance is signalled by higher layers and has the possible settings shown in table 8.1.2.1.1-1.

Table 8.1.2.1.1-1: Measurement Scaling factor Configurations supported by the UE

	MeasScaleFactor information element settting	K _n	K _r
sf-EUTRA-cf1	8	8/7	8
sf-EUTRA-cf2	16	16/15	16

If no reduced performance group carrier is configured, the UE shall consider all carriers to have normal performance

If no *MeasScaleFactor* is configured, a UE indicating support for increased carrier monitoring E-UTRA or increased carrier monitoring UTRA shall monitor at least the number of carriers specified in section 8.1.2.1.1.1 and is not required to monitor the increased number of carriers specified in section 8.1.2.1.1.1a.

The following definitions are used in the performance requirements:

$$N_{freq} = N_{freq,n} + N_{freq,r}$$

Where:

 $N_{\text{freq,n}} = N_{\text{freq, E-UTRA, normal}} + N_{\text{freq, UTRA, normal}} + M_{\text{gsm}} + N_{\text{freq, cdma2000}} + N_{\text{freq, HRPD}} : Total \ number \ of \ interfrequency carriers to be monitored with normal measurement performance}$

 $N_{\text{freq,r}} = N_{\text{freq, E-UTRA,reduced}} + N_{\text{freq, UTRA, reduced}}$: Total number of interfrequency carriers to be monitored with reduced measurement performance

Where:

 $N_{\text{freq, E-UTRA,normal}}$: Number of interfrequency carriers to be monitored with normal performance

N_{freq, E-UTRA,normal,FDD}: Number of interfrequency FDD carriers to be monitored with normal performance

N_{freq. E-UTRA,normal,TDD}: Number of interfrequency TDD carriers to be monitored with normal performance

 $N_{\text{freq, E-UTRA,reduced}}$: Number of interfrequency carriers to be monitored with reduced performance

 $N_{\text{freq, UTRA,normal}}$: Number of UTRA carriers (FDD and TDD) to be monitored with normal performance

 $N_{\text{freq, E-UTRA,normal,FDD}}$: Number of interfrequency FDD carriers to be monitored with normal performance

 $N_{\text{freq, E-UTRA,normal,TDD}}$. Number of interfrequency TDD carriers to be monitored with normal performance

 $N_{\text{freq, UTRA, reduced}}$: Number of UTRA carriers (FDD and TDD) to be monitored with reduced performance

For interfrequency carriers, if $N_{\text{freq, E-UTRA,reduced}}$ is not equal to zero then K_n and K_r are as shown in table 8.1.2.1.1-1. Otherwise K_n =1 and all interfrequency layers have normal performance.

For UTRAN carriers, if $N_{\text{freq, UTRA,reduced}}$ is not equal to zero then K_n and K_r are as shown in table 8.1.2.1.1-1. Otherwise K_n =1 and all UTRA frequency layers have normal performance.

The minimum performance requirements for a UE which indicates support for Increased UE carrier monitoring E-UTRA [2, 31] are calculated as defined in sections 8.1.2.3.1 and 8.1.2.3.2 provided that $N_{freq, E-UTRA, normal} \le 3$ for a UE capable of either FDD E-UTRA carrier monitoring or TDD E-UTRA carrier monitoring or $N_{freq, E-UTRA, normal} \le 6$ for a UE

capable of both FDD and TDD E-UTRA carrier monitoring provided $N_{freq, E-UTRA, normal, FDD} \leq 3$ E-UTRA carriers and $N_{freq, E-UTRA, normal, TDD} \leq 3$ TDD E-UTRA carriers or if $N_{freq,n} = N_{freq}$. The minimum performance requirements for a UE which indicates support for Increased UE carrier monitoring UTRA [2, 31] are calculated as defined in sections 8.1.2.4.1, 8.1.2.4.3, 8.1.2.4.7 and 8.1.2.4.13 provided that $N_{freq, UTRA, normal} \leq 3$ for UE capable of either FDD UTRA carrier monitoring or TDD UTRA carrier monitoring or $N_{freq, UTRA, normal} \leq 6$ for a UE capable of both FDD and TDD UTRA carriers monitoring provided $N_{freq, UTRA, normal, FDD} \leq 3$ FDD UTRA carriers and $N_{freq, UTRA, normal, TDD} \leq 3$ TDD UTRA carriers or if $N_{freq,n} = N_{freq}$. Capabilities for number of carriers to monitor for a UE which supports Increased carrier monitoring E-UTRA or Increased carrier monitoring UTRA are specified in section 8.1.2.1.1.1a.

8.1.2.2 E-UTRAN intra frequency measurements

The UE shall be able to identify new intra-frequency cells and perform RSRP, RSRQ, and RS-SINR measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

8.1.2.2.1 E-UTRAN FDD intra frequency measurements

8.1.2.2.1.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{\text{identify intra}} = T_{\text{basic_identify_E-UTRA_FDD, intra}} \cdot \frac{T_{\text{Measurement_Period, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

where

T_{basic_identify_E-UTRA_FDD, intra} is 800 ms

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.2.1 and 9.1.2.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.5.1 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Section 9.1.17.2.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band.

 T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement intra}}$ cells , where $Y_{\text{measurement intra}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra}}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP, RSRQ, and RS-SINR measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement intra}} = Floor \left\{ X_{\text{basic measurement FDD}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period, Intra}}} \right\} \text{cells}$$

where

 $X_{basic measurement FDD} = 8 (cells),$

 $T_{Measurement_Period,\ Intra} = 200\ ms$ is the measurement period for intra frequency RSRP, RSRQ, and RS-SINR measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.2.1 and 9.1.2.2, the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.5.1, and RS-SINR measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.17.2.1.

8.1.2.2.1.1.1 Measurement Reporting Requirements

8.1.2.2.1.1.1.1 Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

8.1.2.2.1.1.1.2 Event-triggered Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.2.1.1.1.3.

8.1.2.2.1.1.1.3 Event Triggered Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify\ intra}$ defined in Clause 8.1.2.2.1.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra}$ defined in clause 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.2.1.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra}$ as shown in table 8.1.2.2.1.2-1. When eDRX_CONN is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra}$ as shown in table 8.1.2.2.1.2-1A.

Table 8.1.2.2.1.2-1: Requirement to identify a newly detectable FDD intrafrequency cell

DRX cycle length (s)	T _{identify_intra} (s) (DRX cycles)	
≤0.04	0.8 (Note1)	
0.04 <drx-< td=""><td>Note2 (40)</td></drx-<>	Note2 (40)	
cycle≤0.08		
0.128	3.2 (25)	
0.128 <drx-< td=""><td>Note2(20)</td></drx-<>	Note2(20)	
cycle≤2.56		
Note1: Number of DRX cycle		
depends upon	the DRX cycle in use	

Note2: Time depends upon the DRX cycle in use

Table 8.1.2.2.1.2-1A: Requirement to identify a newly detectable FDD intra-frequency cell when eDRX CONN cycle is used

eDRX_CONN cycle length (s)	T _{identify_intra} (s) (eDRX_CONN cycles)
2.56 <edrx_conn cycle≤10.24="" note(20)<="" td=""></edrx_conn>	
Note: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.2.1 and 9.1.2.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.5.1 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Section 9.1.17.2.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band.

When DRX is used in the RRC CONNECTED state the measurement period for intra frequency measurements is T_{measure intra} as shown in table 8.1.2.2.1.2-2. When eDRX_CONN is used in the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra}$ as shown in table 8.1.2.2.1.2-3. The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of T_{measure intra}.

Table 8.1.2.2.1.2-2: Requirement to measure FDD intrafrequency cells

DRX cycle length (s)	T _{measure_intra} (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04 <drx-< th=""><th>Note2 (5)</th></drx-<>	Note2 (5)
cycle≤2.56	
Note1: Number of DRX cycle	
depends upon the DRX cycle in use	

Note2: Time depends upon the DRX cycle in use

Table 8.1.2.2.1.2-3: Requirement to measure FDD intra-frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{measure_intra} (s) (eDRX_CONN cycles)	
2.56 <edrx_conn cycle≤10.24<="" th=""><th>Note (5)</th></edrx_conn>	Note (5)	
Note: Time depends upon the eDRX_CONN cycle in use		

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.2.1 and 9.1.2.2, the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.5.1, and RS-SINR measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.17.2.1.

8.1.2.2.1.2.1 Measurement Reporting Requirements

8.1.2.2.1.2.1.1 Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

8.1.2.2.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.2.1.2.1.3.

8.1.2.2.1.2.1.3 Event Triggered Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T _{identify_intra} defined in Clause 8.1.2.2.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra}$ defined in clause 8.1.2.2.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.2.2 E-UTRAN TDD intra frequency measurements

8.1.2.2.2.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within

$$T_{\text{identify intra}} = T_{\text{basic identify } E-UTRA_TDD, intra} \cdot \frac{T_{\text{Measurement Period, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

where

T_{basic identify E-UTRA TDD, intra} is 800 ms

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.2.1 and 9.1.2.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.5.1 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Section 9.1.17.2.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band.

 T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement intra}}$ cells , where $Y_{\text{measurement intra}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra}}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP, RSRQ, and RS-SINR measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement intra}} = Floor \left\{ X_{\text{basic measurement TDD}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period, Intra}}} \right\} \text{cells}$$

where

 $X_{\text{basic measurement TDD}} = 8 \text{ (cells)},$

 $T_{Measurement_Period\ Intra} = 200\ ms$ is the measurement period for intra frequency RSRP, RSRQ, and RS-SINR measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.2.1 and 9.1.2.2, the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.5.1, and RS-SINR measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.17.2.1.

8.1.2.2.2.1.1 Measurement Reporting Requirements

8.1.2.2.2.1.1.1 Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

8.1.2.2.2.1.1.2 Event-triggered Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.2.2.1.1.3.

8.1.2.2.2.1.1.3 Event Triggered Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify\ intra}$ defined in Clause 8.1.2.2.2.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception

and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra}$ defined in clause 8.1.2.2.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.2.2.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra}$ as shown in table 8.1.2.2.2.2-1. When eDRX_CONN is in use, the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra}$ as shown in table 8.1.2.2.2-1A.

Table 8.1.2.2.2.2-1: Requirement to identify a newly detectable TDD intrafrequency cell

DRX cycle length (s)	T _{identify_intra} (s) (DRX cycles)	
≤0.04	0.8 (Note1)	
0.04 <drx-< td=""><td>Note2 (40)</td></drx-<>	Note2 (40)	
cycle≤0.08		
0.128	3.2 (25)	
0.128 <drx-< td=""><td>Note2(20)</td></drx-<>	Note2(20)	
cycle≤2.56		
Note 1. Number of DDV avole		

Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use

Table 8.1.2.2.2.1A: Requirement to identify a newly detectable TDD intra-frequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	Tidentify_intra (s) (eDRX_CONN cycles)	
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note(20)</td></edrx_conn>	Note(20)	
Note: Time depends upon the eDRX_CONN cycle in use		

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1.2.1 and 9.1.2.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1.5.1 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Clause 9.1.17.2.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band.

When DRX is in use in the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra}$ as shown in table 8.1.2.2.2.2-2. When eDRX_CONN is in use in the RRC_CONNECTED state, the measurement period for intra frequency measurements is $T_{measure_intra}$ as shown in table 8.1.2.2.2.3. The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra}$.

Table 8.1.2.2.2.2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	T _{measure_intra} (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04 <drx- cycle≤2.56</drx- 	Note2 (5)
d E Note2: Tim	ber of DRX cycle lepends upon the DRX cycle in use. e depends upon the DRX cycle in use.

Table 8.1.2.2.2.3: Requirement to measure TDD intra-frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{measure_intra} (s) (eDRX_CONN cycles)
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note (5)</td></edrx_conn>	Note (5)
Note: Time depends upon the eDRX_CONN cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.2.1 and 9.1.2.2, the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.5.1, and the RS-SINR measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.17.2.1.

8.1.2.2.2.1 Measurement Reporting Requirements

8.1.2.2.2.1.1 Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

8.1.2.2.2.1.2 Event-triggered Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.2.2.2.1.3.

8.1.2.2.2.1.3 Event Triggered Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.1, 9.1.2.2, 9.1.5.1, and 9.1.17.2.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T _{identify_intra} defined in Clause 8.1.2.2.2.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra}$ defined in clause 8.1.2.2.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.2.3 E-UTRAN FDD intra frequency measurements with autonomous gaps

8.1.2.2.3.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify_CGI, intra}} = T_{\text{basic_identify_CGI, intra}}$$
 ms

Where

 $T_{basic_identify_CGI, intra} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Es/Iot according to Annex B.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI,intra}$ is applicable when no DRX is used as well as when any of the DRX or eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify_CGI, intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 60 ACK/NACKs on PCell or each of activated SCell(s), provided that:

- there is continuous DL data allocation,
- no DRX and no eDRX_CONN cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

8.1.2.2.3.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.2.4 E-UTRAN TDD intra frequency measurements with autonomous gaps

8.1.2.2.4.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify CGI, intra}} = T_{\text{basic identify CGI, intra}}$$
 ms

Where

 $T_{basic_identify_CGI,\;intra} = 150\;ms.\;This\;is\;the\;time\;period\;used\;in\;the\;above\;equation\;where\;the\;maximum\;allowed\;time\;$ for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within T_{basic_identify_CGI, intra} is applicable when no DRX is used as well as when any of the DRX or eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify_CGI,\,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.1.2.2.4.1-1 on PCell or each of activated SCell(s), provided that:

- there is continuous DL data allocation,
- no DRX and no eDRX CONN cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.1.2.2.4.1-1: Requirement on minimum number of ACK/NACKs to transmit during T_{basic} identify CGI, intra-

UL/DL configuration	Minimum number of transmitted ACK/NACKs	
0 (Note 1)	18	
1	35	
2	43	
3	36	
4	39	
5	42	
6	30	
	configured with EIMTA- ervCell via RRC signalling [2]	

only this requirement shall apply

8.1.2.2.4.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.3 E-UTRAN inter frequency measurements

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

8.1.2.3.1 E-UTRAN FDD – FDD inter frequency measurements

8.1.2.3.1.1 E-UTRAN FDD – FDD inter frequency measurements when no DRX is used

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\ Inter}$ according to the following expression:

$$\mathbf{T}_{\text{Identify_Inter}} = \mathbf{T}_{\text{Basic_Identify_Inter}} \cdot \frac{480}{\mathbf{T}_{\text{Inter1}}} \cdot N_{\textit{freq},n} \cdot K_{\textit{n}} \quad \textit{ms} \, (\text{normal performance}) \, \text{and} \, \frac{1}{2} \left(\frac{1}{2} \sum_{i=1}^{n} \frac{1}{2} \sum_{i=1}^$$

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter}}} \cdot N_{freq,r} \cdot K_r \quad ms \text{ (reduced performance)}$$

Where:

 $T_{Basic_Identify_Inter} = 480$ ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

 $N_{freq,n}$ $N_{freq,r}$ K_n and K_r are defined in clause 8.1.2.1.1 and T_{inter1} is defined in clause 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP|_{dBm} and RSRP Ês/Iot according to Annex B.2.3 for a corresponding Band,
- other RSRP related side conditions given in Sections 9.1.3.1 and 9.1.3.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively, with measurement period given by table 8.1.2.3.1.1-1.

Table 8.1.2.3.1.1-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: T _{Measurement_Period_Inter_FDD} [ms] (normal performance)	Physical Layer Measurement period: T _{Measurement_Period_Inter_FDD} [ms] (reduced performance)	Measurement bandwidth [RB]	
	480 x K _n x N _{freq,n}	$480 \times K_r \times N_{freq,r}$	6	
0		·		
1 (Note)	$240 \times K_n \times N_{freq,n}$	240 x K _r x N _{freq,r}	50	
Note: This configuration is optional				

The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies or 8 FDD interfrequencies if the UE supports Increased UE carrier monitoring E-UTRA and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period defined in Table 8.1.2.3.1.1-1.

8.1.2.3.1.1.1 Measurement Reporting Requirements

8.1.2.3.1.1.1 Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

8.1.2.3.1.1.1.2 Event-triggered Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.3.1.1.1.3.

8.1.2.3.1.1.3 Event Triggered Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH . The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify - inter}$ defined in clause 8.1.2.3.1.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_inter}$ defined in clause 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_Inter_FDD}$ defined in clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.3.1.2 E-UTRAN FDD – FDD inter frequency measurements when DRX is used

When DRX or eDRX_CONN is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify_inter}$. When DRX is in use, $T_{identify_inter}$ is as defined in Table 8.1.2.3.1.2-1, and when eDRX_CONN is in use, $T_{identify_inter}$ is as defined in Table 8.1.2.3.1.2-1A.

Table 8.1.2.3.1.2-1: Requirement to identify a newly detectable FDD interfrequency cell

DRX cycle	T _{identify_inter} (s) (DRX cycles), normal performance		T _{identify_inter} (s) (DRX perform	
length (s)	Gap period =	Gap period =	Gap period = 40	Gap period =
	40 ms	80 ms	ms	80 ms
≤0.16	Non DRX	Non DRX	Non DRX	Non DRX
	Requirements in	Requirements in	Requirements in	Requirements in
	clause 8.1.2.3.1.1	clause 8.1.2.3.1.1	clause 8.1.2.3.1.1	clause 8.1.2.3.1.1
	are applicable	are applicable	are applicable	are applicable
0.256	$5.12*K_n*N_{freq,n}$	$7.68*K_n*N_{freq,n}$	$5.12*K_r*N_{freq,r}$	$7.68*K_r*N_{freq,r}$
	$(20*K_n*N_{freq,n})$	$(30*K_n *N_{freq,n})$	$(20*K_r*N_{freq,r})$	$(30*K_r*N_{freq,r})$
0.32	6.4*K _n *N _{freq,n}	7.68*K _n *N _{freq,nl}	$6.4*K_r*N_{freq,r}$	7.68*K _r *N _{freq,r}
	$(20*K_n*N_{freq,n})$	(24*Kn*Nfreq,n)	$(20*K_r*N_{freq,r})$	$(24*K_r*N_{freq,r})$
0.32<	Note (20*K _n	Note (20*K _n	Note (20*K _r	Note (20*K _r
DRX-	*N _{frea.n})	*N _{frea.n})	*N _{freg.r})	*N _{freq.r})
cycle≤2.56			- 4,-7	- 4,-7
Note: Tir	ne depends upon the	e DRX cycle in use		

Table 8.1.2.3.1.2-1A: Requirement to identify a newly detectable FDD inter-frequency cell when eDRX CONN cycle is used

eDRX_CONN cycle length	T _{identify_inter} (s) (eDRX_CONN cycles), normal performance		T _{identify_inter} (s) (eDRX_CONN cycles reduced performance	
(s)	Gap period = 40	Gap period = 80	Gap period = 40	Gap period = 80
	ms	ms	ms	ms
2.56<	Note (20*K _n	Note (20*K _n	Note (20*K _r	Note (20*K _r
eDRX_CONN	$*N_{freq,n}$)	$*N_{freq,n}$)	$*N_{freq,r}$)	$*N_{freq,r}$)
cycle≤10.24	r	r		, ,
Note: Time dep	ends upon the eDR	CONN cycle in use)	

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP_{dBm} and RSRP Ês/Iot according to Annex B.2.3 for a corresponding Band,
- other RSRP related side conditions given in Clause 9.1.3.1 and 9.1.3.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} SCH Ês/Iot according to Annex B.2.3 for a corresponding Band.

When DRX or eDRX_CONN is in use, the UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period $T_{measure_inter}$, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps. When DRX is used, $T_{measure_inter}$ is as defined in Table 8.1.2.3.1.2-2, and when eDRX_CONN is in use, $T_{measure_inter}$ is as defined in Table 8.1.2.3.1.2-3.

Table 8.1.2.3.1.2-2: Requirement to measure FDD interfrequency cells

DRX cycle length (s)	T _{measure_inter} (s) (DRX cycles) (normal performance)	T _{measure_inter} (s) (DRX cycles) (reduced performance)
≤0.08	Non DRX	Non DRX
	Requirements in	Requirements in
	clause 8.1.2.3.1.1	clause 8.1.2.3.1.1
	are applicable	are applicable
0.08 <drx-< td=""><td>Note (5*K_n*N_{freq,n})</td><td>Note (5*K_r*N_{freq,r})</td></drx-<>	Note (5*K _n *N _{freq,n})	Note (5*K _r *N _{freq,r})
cycle≤2.56		
Note: Time dep	ends upon the DRX cy	cle in use

Table 8.1.2.3.1.2-3: Requirement to measure FDD inter-frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{measure_inter} (s) (eDRX_CONN cycles) (normal performance)	T _{measure_inter} (s) (eDRX_CONN cycles) (reduced performance)		
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note $(5*K_n*N_{freq,n})$</td><td>Note (5*K_r*N_{freq,r})</td></edrx_conn>	Note $(5*K_n*N_{freq,n})$	Note (5*K _r *N _{freq,r})		
Note: Time depends upon the eDRX_CONN cycle in use				

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.3.1 and 9.1.3.2, the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2, and the RS-SINR measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.17.3.1 and 9.1.17.3.2.

8.1.2.3.1.2.1 Measurement Reporting Requirements

8.1.2.3.1.2.1.1 Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

8.1.2.3.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.3.1.2.1.3.

8.1.2.3.1.2.1.3 Event Triggered Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_inter}$ defined in clause 8.1.2.3.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_inter}$ defined in clause 8.1.2.3.1.2 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{measure_inter}$ defined in clause 8.1.2.3.1.2 provided the timing to that cell has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.3.2 E-UTRAN TDD – TDD inter frequency measurements

8.1.2.3.2.1 E-UTRAN TDD – TDD inter frequency measurements when no DRX is used

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new TDD inter-frequency within $T_{Identify_Inter}$ according to the following expression:

- When configuration 0 or configuration 1 in Table 8.1.2.3.2.1-1 is applied,

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Interl}}} \cdot N_{\text{freq}} \quad ms$$

- When configuration 2 or configuration 3 in Table 8.1.2.3.2.1-1 is applied,

$$\label{eq:total_continuity_Inter} \begin{split} T_{\text{Identify_Inter}} &= T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter1}}} \cdot N_{\textit{freq}} + 240 \cdot N_{\textit{freq}} \quad \textit{ms} \; ,. \end{split}$$

 $T_{Basic_Identify_Inter} = 480$ ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

 N_{freq} is defined in clause 8.1.2.1.1 and T_{inter1} is defined in clause 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP_{dBm} and RSRP Ês/Iot according to Annex B.2.3 for a corresponding Band,
- other RSRP related side conditions given in Clause 9.1.3.1 and 9.1.3.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- $SCH_RP|_{dBm}$ and SCH $\hat{E}s/Iot$ according to Annex B.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively, with measurement period ($T_{Measurement_Period_TDD_Inter}$) given by table 8.1.2.3.2.1-1:

Table 8.1.2.3.2.1-1: T_{Measurement_Period_TDD_Inter} for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub- frames per half frame (5 ms)		Dw	PTS	T _{Measurement_Period} _ _{_TDD_Inter} [ms]	T _{Measurement_Period_T} DD_Inter [ms] (reduced performance)
		DL	UL	Normal CP	Extended CP		

0	6	2	2	$19760 \cdot T_{\rm s}$	$20480 \cdot T_{\rm s}$	480 x K _n x N _{freq,n}	480 x K _r x N _{freq,r}
1 (Note 1)	50	2	2	$19760 \cdot T_{s}$	$20480 \cdot T_{\rm s}$	240 x K _n x N _{freq,n}	240 x K _r x N _{freq,r}
				3	3		
2	6	1	3	19760 · T _s	$20480 \cdot T_s$	720 x K _n x N _{freq,n}	720 x K _r x N _{freq,r}
				3	5	ř	·
3 (Note 1)	50	1	3	19760 · T _s	$20480 \cdot T_{\rm s}$	480 x K _n x N _{freq,n}	480 x K _r x N _{freq,r}
				5	5	ř	
Note 1: This c	onfiguration is opt	ional					
Note 2: T _s is defined in TS 36.211 [16]							
Note 3: N/A.							

The UE shall be capable of performing RSRP, RSRQ, RS-SINR measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period $T_{\text{Measurement Period TDD Inter}}$.

8.1.2.3.2.1.1 Measurement Reporting Requirements

8.1.2.3.2.1.1.1 Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

8.1.2.3.2.1.1.2 Event-triggered Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.3.2.1.1.3.

8.1.2.3.2.1.1.3 Event Triggered Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify_Inter}$ defined in clause 8.1.2.3.2.1. When L3 filtering is used or IDC autonomous denial or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify_Inter}$ defined in clause 8.1.2.3.2.1 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_TDD_Inter}$ defined in clause 8.1.2.3.2.1 provided the timing to that cell has not changed more than \pm 50 Ts while measurementgap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.3.2.2 E-UTRAN TDD – TDD inter frequency measurements when DRX is used

When DRX or eDRX_CONN is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN TDD inter

frequency cell within $T_{identify_inter}$. When DRX is in use, $T_{identify_inter}$ is as defined in Table 8.1.2.3.2.2-1, and when eDRX_CONN is in use $T_{identify_inter}$ is as defined in Table 8.1.2.3.2.2-1A.

Table 8.1.2.3.2.2-1: Requirement to identify a newly detectable TDD interfrequency cell

DRX cycle length (s)	T _{identify_inter} (s) (DRX cycles) (normal performance)		T _{identify_inter} (s) (reduced pe	(DRX cycles) erformance)
	Gap period =	Gap period =	Gap period =	Gap period =
	40 ms	80 ms	40 ms	80 ms
≤0.16	Non DRX	Non DRX	Non DRX	Non DRX
	Requirements in	Requirements in	Requirements in	Requirements in
	clause 8.1.2.3.2.1	clause 8.1.2.3.2.1	clause 8.1.2.3.2.1	clause 8.1.2.3.2.1
	are applicable	are applicable	are applicable	are applicable
0.256	$5.12*K_n*N_{freq,n}$	7.68*K _n *N _{freq,n}	$5.12*K_r*N_{freq,r}$	7.68*K _r *N _{freq,r}
	$(20*K_n *N_{freq,n})$	$(30*K_n *N_{freq,n})$	$(20*K_r *N_{freq,r})$	$(30*K_r*N_{freq,r})$
0.32	$6.4*K_n*N_{freq,n}$	$7.68*K_n*N_{freq,n}$	$6.4*K_r*N_{freq,r}$	7.68*K _r *N _{freq,r}
	(20*K _n *N _{freq,n})	(24*K _n *N _{freq,n})	$(20*K_r*N_{freq,r})$	(24*K _r *N _{freq,r})
0.32 <drx-< td=""><td>Note (20*K_n</td><td>Note (20*K_n</td><td>Note (20*K_r</td><td>Note (20*K_r</td></drx-<>	Note (20*K _n	Note (20*K _n	Note (20*K _r	Note (20*K _r
cycle≤2.56	$*N_{freq,n}$)	$*N_{freq,n}$)	$*N_{freq,r}$)	$*N_{freq,r}$)
Note: Ti	me depends upon th	e DRX cycle in use		

Table 8.1.2.3.2.2-1A: Requirement to identify a newly detectable TDD inter-frequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{identify_inter} (s) (eDRX_CONN cycles) (normal performance)			
	Gap period = Gap period =		Gap period =	Gap period =
	40 ms	80 ms	40 ms	80 ms
2.56 <edrx_conn< td=""><td>Note (20*K_n</td><td>Note (20*K_n</td><td>Note (20*K_r</td><td>Note (20*K_r</td></edrx_conn<>	Note (20*K _n	Note (20*K _n	Note (20*K _r	Note (20*K _r
cycle ≤10.24	$*N_{freq,n}$)	*N _{freq,n})	$*N_{freq,r}$)	$*N_{freq,r}$)
Note: Time depends	upon the eDRX_CO	ONN cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP_{dBm} and RSRP Ês/Iot according to Annex B.2.3 for a corresponding Band,
- other RSRP related side conditions given in Clause 9.1.3.1 and 9.1.3.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.3 for a corresponding Band.

When DRX or eDRX_CONN is in use, the UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period $T_{measure_inter}$, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps. When DRX is in use, $T_{measure_inter}$ is as defined in Table 8.1.2.3.2.2-2, and when eDRX_CONN is in use, $T_{measure_inter}$ is as defined in Table 8.1.2.3.2.2-3.

DRX cycle T_{measure_inter} (s) T_{measure_inter} (s) (DRX cycles) length (s) (DRX cycles) (normal (reduced requirement) requirement) ≤0.08 Non DRX Non DRX Requirements in Requirements in clause 8.1.2.3.2.1 clause 8.1.2.3.2.1 are applicable are applicable 0.128 When configuration When configuration 2 non DRX 2 non DRX Requirements in Requirements in clause 8.1.2.3.2.1 clause 8.1.2.3.2.1 are applicable, are applicable, Otherwise Otherwise Note (5*K_n*N_{freq,n}) Note (5*K_r*N_{freq,r}) 0.128<DRX-Note $(5*K_n*N_{freq,n})$ Note $(5*K_r*N_{freq,r})$

Table 8.1.2.3.2.2-2: Requirement to measure TDD interfrequency cells

Table 8.1.2.3.2.2-3: Requirement to measure TDD inter-frequency cells when eDRX_CONN cycle is used

Time depends upon the DRX cycle in use

eDRX_CON length	(s) (e	T _{measure_inter} (s) eDRX_CONN cycles) normal requirement)	T _{measure_inter} (s) (eDRX_CONN cycles) (reduced requirement)		
2.56 <edrx cycle ≤1</edrx 		Note (5*K _n *N _{freq,n})	Note $(5*K_r*N_{freq,r})$		
Note: Tir	Note: Time depends upon the eDRX_CONN cycle in use				

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.3.1 and 9.1.3.2, the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2, and the RS-SINR measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.17.3.1 and 9.1.17.3.2.

8.1.2.3.2.2.1 Measurement Reporting Requirements

cycle≤2.56

Note:

8.1.2.3.2.2.1.1 Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

8.1.2.3.2.2.1.2 Event-triggered Periodic Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.3.2.2.1.3.

8.1.2.3.2.2.1.3 Event Triggered Reporting

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the requirements in clause 9.1.3.1, 9.1.3.2, 9.1.6.1, 9.1.6.2, 9.1.17.3.1 and 9.1.17.3.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay

uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify_Inter}$ defined in Clause 8.1.2.3.2.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify_Inter}$ in clause 8.1.2.3.2.2 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{measure_inter}$ in clause 8.1.2.3.2.2 provided the timing to that cell has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.3.3 E-UTRAN TDD – FDD inter frequency measurements

8.1.2.3.3.1 E-UTRAN TDD – FDD inter frequency measurements when no DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.1.2.3.1.1 also apply for this section.

8.1.2.3.3.2 E-UTRAN TDD – FDD inter frequency measurements when DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

When DRX or eDRX_CONN cycle is used, the requirements in clause 8.1.2.3.1.2 shall also apply for this section.

8.1.2.3.4 E-UTRAN FDD – TDD inter frequency measurements

8.1.2.3.4.1 E-UTRAN FDD – TDD inter frequency measurements when no DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.1.2.3.2.1 also apply for this section.

8.1.2.3.4.2 E-UTRAN FDD – TDD inter frequency measurements when DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

When DRX or eDRX_CONN cycle is used, the requirements in clause 8.1.2.3.2.2 shall also apply for this section.

8.1.2.3.5 E-UTRAN FDD-FDD inter frequency measurements with autonomous gaps

8.1.2.3.5.1 Identification of a new CGI of E-UTRA FDD cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify_CGI, inter}} = T_{\text{basic_identify_CGI, inter}}$$
 ms

Where

 $T_{basic_identify_CGI, inter} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP_{dBm} and SCH Ês/Iot according to Annex B.2.3 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within T_{basic_identify_CGI,inter} is applicable when no DRX is used as well as when any of the DRX or eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify_CGI, intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 60 ACK/NACKs on PCell or each of activated SCell(s), provided that:

- there is continuous DL data allocation,
- no DRX and no eDRX_CONN cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

8.1.2.3.5.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.3.6 E-UTRAN TDD-FDD inter frequency measurements using autonomous gaps

The requirements in this clause shall apply to UE supporting FDD and TDD.

8.1.2.3.6.1 Identification of a new CGI of E-UTRA FDD cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify_CGI, inter} = T_{basic_identify_CGI, inter}$$
 ms

Where

 $T_{basic_identify_CGI, inter} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.4 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI,inter}$ is applicable when no DRX is used as well as when any of the DRX or eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify_CGI,inter}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.1.2.3.6.1-1 on PCell or each of activated SCell(s), provided that:

- there is continuous DL data allocation,
- no DRX and no eDRX_CONN cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.1.2.3.6.1-1: Requirement on minimum number of ACK/NACKs to transmit during T_{basic_identify_CGI, inter}.

TDD UL/DL configuration for serving cell		Minimum number of transmitted ACK/NACKs	
0 (Note 1)		18	
1		30	
Note 1:	When a UE is configured with EIMTA- MainConfigServCell via RRC signalling [2] only this requirement shall apply.		
Note 2:			

8.1.2.3.6.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.3.7 E-UTRAN TDD-TDD inter frequency measurements with autonomous gaps

8.1.2.3.7.1 Identification of a new CGI of E-UTRA TDD cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify CGI, inter}} = T_{\text{basic identify CGI, inter}}$$
 ms

Where

 $T_{basic_identify_CGI, inter} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.4 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within T_{basic_identify_CGI,inter} is applicable when no DRX is used as well as when any of the DRX or eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{\text{identify_CGI,inter}}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.1.2.3.7.1-1 on PCell or each of activated SCell(s), provided that:

- there is continuous DL data allocation,
- no DRX and no eDRX_CONN cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.1.2.3.7.1-1: Requirement on minimum number of ACK/NACKs to transmit during $T_{basic_identify_CGI, inter}$.

	DL configuration serving cell	Minimum number of transmitted ACK/NACKs	
0 (Note 1)	18	
1		30	
Note 1:		ofigured with <i>EIMTA-</i> Self via RRC signalling [2] only Schall apply cell.	
Note 2:			

8.1.2.3.7.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.3.8 E-UTRAN FDD-TDD inter frequency measurements using autonomous gaps

The requirements in this clause shall apply to UE supporting FDD and TDD.

8.1.2.3.8.1 Identification of a new CGI of E-UTRA TDD cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify_CGI, inter}} = T_{\text{basic_identify_CGI, inter}}$$
 ms

Where

 $T_{basic_identify_CGI, inter} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex B.2.4 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within T_{basic_identify_CGI,inter} is applicable when no DRX is used as well as when any of the DRX or eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify_CGI, inter}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall have more than 60 ACK/NACKs transmitted on PCell or each of activated SCell(s), provided that:

- there is continuous DL data allocation,
- no DRX and no eDRX_CONN cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

8.1.2.3.8.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.4 Inter RAT measurements

8.1.2.4.1 E-UTRAN FDD – UTRAN FDD measurements

8.1.2.4.1.1 E-UTRAN FDD – UTRAN FDD measurements when no DRX is used

8.1.2.4.1.1.1 Identification of a new UTRA FDD cell

When explicit neighbour list is provided and no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, UTRA_FDD}} = T_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_n \cdot N_{freq,n}$$
 ms (normal performance),

and

$$T_{\text{identify, UTRA_FDD}} = T_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_r \cdot N_{freq,r} \quad \textit{ms} \text{ (reduced performance)}$$

A cell shall be considered detectable when

- CPICH Ec/Io \geq -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.4.1.1.1a Enhanced UTRA FDD cell identification requirements

When explicit neighbour list is provided and no DRX is used or when DRX cycle length \leq 40 ms, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within $T_{identify,\,enhanced_UTRA_FDD}$:

$$T_{\text{identify, enhanced_UTRA_FDD}} = (T_{\text{basic_identify_enhanced_UTRA_FDD}} \cdot \frac{480}{T_{\text{inter1}}} + 480) K_n N_{freq,n} \quad ms \text{ (normal performance)}$$

and

$$T_{\text{identify, enhanced_UTRA_FDD}} = (T_{\text{basic_identify_enhanced_UTRA_FDD}} \cdot \frac{480}{T_{\text{inter1}}} + 480) \; K_r N_{\textit{freq,r}} \quad \textit{ms} \; (\text{reduced performance})$$

A cell shall be considered detectable when:

- CPICH Ec/Io > -15 dB,
- SCH_Ec/Io ≥ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.4.1.1.2 UE UTRA FDD CPICH measurement capability

When measurement gaps are scheduled for UTRA FDD inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Clause 9.2 with measurement period given by

$$T_{\text{measurement_UTRA_FDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_FDD}}, T_{\text{basic_measurement_UTRA_FDD}}, \frac{480}{T_{\text{interl}}} \cdot K_n \cdot N_{freq,n} \right\} ms \text{ (normal performance)},$$

and

$$T_{\text{measurement_UTRA_FDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_FDD}}, T_{\text{basic_measurement_UTRA_FDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot K_r \cdot N_{\text{freq.r}} \right\} ms \text{ (reduced performance)}$$

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurementUTRA_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement_UTRA_FDD}$.

 $T_{Measurement_Period\ UTRA_FDD}$ = 480 ms. The period used for calculating the measurement period $T_{measurement_UTRA_FDD}$ for UTRA FDD CPICH measurements.

 $T_{basic_identify_UTRA_FDD} = 300$ ms. This is the time period used in the inter RAT equation in clause 8.1.2.4.1.1.1 where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

 $T_{basic_identify_enhanced_UTRA_FDD} = 60$ ms. This is the time period used in the inter RAT equation in clause 8.1.2.4.1.1.1a where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

 $T_{basic_measurement_UTRA_FDD} = 50$ ms. This is the time period used in the equation for defining the measurement period for inter RAT CPICH measurements.

 $N_{freq. n}$, $N_{freq. r}$, K_n and K_r are defined in clause 8.1.2.1.1 and T_{interl} is defined in clause 8.1.2.1

8.1.2.4.1.1.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in clause 9.

8.1.2.4.1.1.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\, UTRA_FDD}$ defined in Clause 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify,\, enhanced_UTRA_FDD}$ defined in Clause 8.1.2.4.1.1.1a for the enhanced requirements When L3 filtering is used or IDC autonomous denial or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\,UTRA_FDD}$ defined in clause 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify,\,enhanced_UTRA_FDD}$ defined in Clause 8.1.2.4.1.1.1a for the enhanced requirements and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{measurement_UTRA_FDD}$ defined in clause 8.1.2.4.1.1.2 provided the timing to that cell has not changed more than \pm 32 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.4.1.1.5 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.4.1.1.4.

8.1.2.4.1.2 E-UTRAN FDD – UTRAN FDD measurements when DRX is used

When explicit neighbour list is provided and DRX or eDRX_CONN is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within $T_{identify,UTRA_FDD}$. When DRX is used, $T_{identify,UTRA_FDD}$ is as defined in table 8.1.2.4.1.2-1, and when eDRX_CONN is used, $T_{identify,UTRA_FDD}$ is as defined in table 8.1.2.4.1.2-1A.

Table 8.1.2.4.1.2-1: Requirement to identify a newly detectable UTRA FDD cell

DRX cycle length (s)	T _{identify_UTRA_FDD} (s) (DRX cycles) normal requirement		Tidentify_UTRA_FDD (S) (DRX cy	cles) reduced requirement
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
≤0.04	Non DRX Requirements in clause 8.1.2.4.1.1 are applicable	Non DRX Requirements in clause 8.1.2.4.1.1 are applicable	Non DRX Requirements in clause 8.1.2.4.1.1 are applicable	Non DRX Requirements in clause 8.1.2.4.1.1 are applicable
0.064	2.56*K _n * N _{freq,n} (40* Nf _{freq,n})	4.8* K _n * N _{freq,n} (75* K _n * N _{freq,n})	2.56*K _r * N _{freq,r} (40* K _r * Nf _{freq,r})	4.8* K _r * N _{freq,r} (75* K _r * N _{freq,r})
0.08	3.2* K _n * N _{freq,n} (40* K _n * N _{freq,n})	4.8* K _n * N _{freq,n} (60* K _n * N _{freq,n})	3.2* K _r * N _{freq,r} (40* K _r * N _{freq,r})	4.8* K _r * N _{freq,r} (60* K _r * N _{freq,r})
0.128	3.2* K _n * N _{freq,n} (25* K _n * Nfreq)	4.8* K _n * N _{freq,n} (37.5* K _n * N _{freq,n})	3.2* K _r * N _{freq,n} (25* K _r * N _{freq,r})	4.8* K _r * N _{freq,r} (37.5* K _r * N _{freq,r})
0.16	3.2* K _n * N _{freq,n} (20* K _n * N _{freq,n})	4.8* K _n * N _{freq,n} (30* K _n * N _{freq,n})	3.2* K _r * N _{freq,n} (20* K _r * N _{freq,r})	4.8* K _r * N _{freq,r} (30* K _r * N _{freq,r})
0.16 <drx- cycle≤2.56</drx- 	Note (20* K _n * N _{freq,n})	Note (20* K _n * N _{freq,n})	Note (20* K _r * N _{freq,r})	Note (20* K _r * N _{freq,r})
Note: Time of	lepends upon the DF	XX cycle in use		

Table 8.1.2.4.1.2-1A: Requirement to identify a newly detectable UTRA FDD cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{identify_UTRA_FDD} (s) (eDRX_CONN cycles) normal requirement		T _{identify_UTRA_FDD} (S) (c) reduced re	eDRX_CONN cycles) equirement
	Gap period = 40	Gap period = 80	Gap period = 40	Gap period = 80
	ms	ms	ms	ms
2.56 <edrx_conn cycle≤10.24</edrx_conn 	Note (20* K _n * N _{freq,n})	Note (20* K _n * N _{freq,n})	Note (20* K _r * N _{freq,r})	Note (20* K _r * N _{freq,r})
Note: Time depends	Note: Time depends upon the eDRX_CONN cycle in use			

A cell shall be considered detectable provided following conditions are fulfilled: A cell shall be considered detectable when

- CPICH Ec/Io \geq -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When DRX or eDRX_CONN is used, the UE shall be capable of performing RSCP and Ec/Io measurements of at least 6 UTRA cells per UTRA FDD carrier for up to 3 UTRA FDD carriers and the UE physical layer shall be capable of reporting RSCP and Ec/Io measurements to higher layers within the measurement period $T_{measure_UTRA_FDD}$, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps. UE supporting Increased UE carrier monitoring UTRA shall be capable of performing RSCP and Ec/Io measurements of at least 6 UTRA cells per UTRA FDD carrier for up to 6 UTRA FDD carriers with maximum of 80 cells consisting of at most 32 cells per frequency layer in the neighbour cell list. When DRX is used, $T_{measure_UTRA_FDD}$ is defined in Table 8.1.2.3.1.2-3.

Table 8.1.2.4.1.2-2: Requirement to measure UTRA FDD cells

DRX cycle length (s)	T _{measure_UTRA_FDD} (s) (DRX cycles) normal requirement				ycles) normal requirement
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms	
≤0.04	Non DRX Requirements in clause 8.1.2.4.1.1 are applicable	Non DRX Requirements in clause 8.1.2.4.1.1 are applicable	Non DRX Requirements in clause 8.1.2.4.1.1 are applicable	Non DRX Requirements in clause 8.1.2.4.1.1 are applicable	
0.064	0.48*K _n * N _{freq,n} (7.5* K _n * N _{freq,n})	0.8* K _n * N _{freq,n} (12.5* K _n * N _{freq,n})	0.48* K _r * N _{freq,r} (7.5* K _r * N _{freq,r})	$0.8^* K_r^* N_{freq,r}$ (12.5* $K_r^* N_{freq,r}$)	
0.08	0.48* K _n * N _{freq,n} (6* K _n * N _{freq,n})	0. 8* K _n * N _{freq,n} (10* N _{freq,n})	0.48* K _r * N _{freq,r} (6* K _r * N _{freq,r})	0. 8* K _r * N _{freq,r} (10* K _r * N _{freq,r})	
0.128	0.64* K _n * N _{freq,n} (5* K _n * N _{freq,n})	0. 8* K _n * N _{freq,n} (6.25* N _{freq,n})	0.64* K _r * N _{freq,r} (5* K _r * N _{freq,r})	0. 8* K _r * N _{freq,r} (6.25* N _{freq,r})	
0.128 <drx- cycle≤2.56</drx- 	Note (5* K _n * N _{freq,n})	Note (5* K _n * N _{freq,n})	Note (5* K _r * N _{freq,r})	Note (5* K _r * N _{freq,r})	
Note: Time de	Note: Time depends upon the DRX cycle in use				

Table 8.1.2.4.1.2-3: Requirement to measure UTRA FDD cells when eDRX CONN cycle is used

eDRX_CONN	T _{measure_UTRA_FDD} (s) (eDRX_CONN cycles)		T _{measure_UTRA_FDD} (s) (T _{measure_UTRA_FDD} (s) (eDRX_CONN cycles)	
cycle length (s)	normal requirement		normal requirement		
	Gap period = 40 Gap period = 80		Gap period = 40	Gap period = 80 ms	
	ms	ms	ms		
2.56 <edrx_conn< td=""><td>Note (5* K_n* $N_{freq,n}$)</td><td>Note (5* K_n* N_{freq,n})</td><td>Note (5* K_r* N_{freq,r})</td><td>Note (5* K_r* N_{freq,r})</td></edrx_conn<>	Note (5* K_n * $N_{freq,n}$)	Note (5* K _n * N _{freq,n})	Note (5* K _r * N _{freq,r})	Note (5* K _r * N _{freq,r})	
cycle≤10.24					
Note: Time depends upon the eDRX_CONN cycle in use					

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.

8.1.2.4.1.2.1 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in clause 9.

8.1.2.4.1.2.2 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,UTRA_FDD}$ defined in Clause 8.1.2.4.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\; UTRA_FDD}$ defined in clause 8.1.2.4.1.2 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{measurement_UTRA_FDD}$ defined in clause 8.1.2.4.1.2 provided the timing to that cell has not changed more than \pm 32 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.4.1.2.3 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.4.1.2.2.

8.1.2.4.2 E-UTRAN TDD – UTRAN FDD measurements

The requirements in clause 8.1.2.4.1 also apply for this section.

- 8.1.2.4.2.1 E-UTRAN TDD UTRAN FDD measurements when no DRX is used
- 8.1.2.4.2.2 E-UTRAN TDD UTRAN FDD measurements when DRX is used

8.1.2.4.3 E-UTRAN TDD – UTRAN TDD measurements

8.1.2.4.3.1 E-UTRAN TDD – UTRAN TDD measurements when no DRX is used

8.1.2.4.3.1.1 Identification of a new UTRA TDD cell

When explicit neighbour list is provided and no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, UTRA_TDD}} = Max \left\{ 5000, T_{\text{basic identify UTRA_TDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_n \cdot N_{freq,n} \right\} ms \text{ (normal performance)},$$

and

$$T_{\text{identify, UTRA_TDD}} = Max \left\{ 5000, T_{\text{basic identify UTRA_TDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_r \cdot N_{freq,r} \right\}_{ms} \text{ (reduced performance)}$$

A cell shall be considered detectable when

- P-CCPCH Ec/Io \geq -8 dB,
- DwPCH_Ec/Io \geq -5 dB.

When L3 filtering is used an additional delay can be expected.

8.1.2.4.3.1.1a Enhanced UTRA TDD cell identification requirements

When explicit neighbour list is provided and no DRX is used or when DRX cycle length \leq 40 ms, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within $T_{identify,\,enhanced_UTRA_TDD}$:

$$T_{\text{identify, enhanced_UTRA_TDD}} = (T_{\text{basic_identify_enhanced_UTRA_TDD}} \cdot \frac{480}{T_{\text{cateral}}} + 480) \cdot K_n \cdot N_{freq,n} \quad ms \text{ (normal performance)},$$

and

$$T_{\text{identify, enhanced_UTRA_TDD}} = (T_{\text{basic_identify_enhanced_UTRA_TDD}} \cdot \frac{480}{T_{\text{inter1}}} + 480) \cdot K_r \cdot N_{\textit{freq,r}} \quad \textit{ms} \text{ (reduced performance)}$$

A cell shall be considered detectable when:

- P-CCPCH_Ec/Io > -6 dB,

- DwPCH_Ec/Io \geq -1 dB

When L3 filtering is used an additional delay can be expected.

8.1.2.4.3.1.2 UE UTRA TDD P-CCPCH RSCP measurement capability

When measurement gaps are scheduled for UTRA TDD inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Clause 9.3 with measurement period given by

$$T_{\text{measurement UTRA_TDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_TDD}}, T_{\text{basic measurement UTRA_TDD}}, \frac{480}{T_{\text{inter1}}} \cdot K_n \cdot N_{freq,n} \right\} ms \text{ (normal performance)}$$

$$T_{\text{measurement UTRA_TDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_TDD}}, T_{\text{basic measurement UTRA_TDD}}, \frac{480}{T_{\text{interl}}} \cdot K_r \cdot N_{freq,r} \right\} ms \text{ (reduced performance)}$$

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA_TDD}$ interfrequency cells per TDD frequency of the monitored set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement_UTRA_TDD}$.

 $X_{basic\ measurement UTRA_TDD} = 6$

 $T_{\text{Measurement_Period UTRA_TDD}}$ = 480 ms is the period used for calculating the measurement period $T_{\text{measurement_UTRA_TDD}}$ for UTRA TDD P-CCPCH RSCP measurements.

 $T_{basic_identify_UTRA_TDD} = 800$ ms is the time period used in the inter RAT equation in clause 8.1.2.4.3.1.1 where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

 $T_{basic_identify_enhanced_UTRA_TDD} = 80$ ms is the time period used in the inter RAT equation in clause 8.1.2.4.3.1.1a where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

 $T_{basic_measurement_UTRA_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

 $N_{freq,n}$, $N_{freq,r}$, K_n and K_r are defined in clause 8.1.2.1.1 and T_{inter1} is defined in clause 8.1.2.1

8.1.2.4.3.1.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in clause 9.

8.1.2.4.3.1.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\,UTRA_TDD}$ defined in Clause 8.1.2.4.3.1.1 for the minimum requirements or $T_{identify,\,enhanced_UTRA_TDD}$ defined in Clause 8.1.2.4.3.1.1a for the enhanced requirements. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\, UTRA_TDD}$ defined in clause 8.1.2.4.3.1.1 for the minimum requirements and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{measurement_UTRA_TDD}$ defined in clause 8.1.2.4.3.1.2 provided the timing to that cell has not changed more than \pm 10 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.4.3.1.5 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.4.3.1.4.

8.1.2.4.3.2 E-UTRAN TDD – UTRAN TDD measurements when DRX is used

When explicit neighbour list is provided and DRX or eDRX_CONN is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within $T_{identify,UTRA_TDD}$. When DRX is used, $T_{identify,UTRA_TDD}$ is as defined in table 8.1.2.4.3.2-1, and when eDRX_CONN is used, $T_{identify,UTRA_TDD}$ is as defined in table 8.1.2.4.3.2-1A.

Table 8.1.2.4.3.2-1: Requirement to identify a newly detectable UTRA TDD cell

DRX cycle length (s)	T _{identify_UTRA_TDD} (s) (DRX cycles) (normal requirement)		T _{identify_UTRA_TDD} (s) (DRX cycles) (reduced requirement)	
length (s)	Gap period = 40	Gap period = 80	Gap period = 40	Gap period = 80
	ms	ms	ms	ms
≤0.32	Non DRX	Non DRX	Non DRX	Non DRX
	Requirements in	Requirements in	Requirements in	Requirements in
	clause 8.1.2.4.3.1	clause 8.1.2.4.3.1	clause 8.1.2.4.3.1	clause 8.1.2.4.3.1
	are applicable	are applicable	are applicable	are applicable
0.32 <drx-< td=""><td>Note (20*K_n*</td><td>Note (25*K_n *</td><td>Note (20*K_r*</td><td>Note (25*K_r *</td></drx-<>	Note (20*K _n *	Note (25*K _n *	Note (20*K _r *	Note (25*K _r *
cycle≤0.512	$N_{freq,n}$)	$N_{freq,n}$)	$N_{freq,r}$)	$N_{freq,r}$)
0.512 <drx-< td=""><td>Note (20*K_n *</td><td>Note</td><td>Note (20*K_r *</td><td>Note</td></drx-<>	Note (20*K _n *	Note	Note (20*K _r *	Note
cycle≤2.56	N _{freq,n})	(20*K _n * N _{freq,n})	N _{freq,r})	(20*K _r * N _{freq,r})
Note: Time depends upon the DRX cycle in use				

Table 8.1.2.4.3.2-1A: Requirement to identify a newly detectable UTRA TDD cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{identify_UTRA_TDD} (s) (eDRX_CONN cycles) (normal requirement)		T _{identify_UTRA_TDD} (s) (eDRX_CONN cycles) (reduced requirement)	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
2.56 <edrx_conn< td=""><td>Note (20*K_n * N_{freq,n})</td><td>Note (20*K_n * N_{freq,n})</td><td>Note (20*K_r * N_{freq,r})</td><td>Note (20*K_r * N_{freq,r})</td></edrx_conn<>	Note (20*K _n * N _{freq,n})	Note (20*K _n * N _{freq,n})	Note (20*K _r * N _{freq,r})	Note (20*K _r * N _{freq,r})
cycle ≤10.24				
Note: Time depends u	Note: Time depends upon the eDRX_CONN cycle in use			

A cell shall be considered detectable provided following conditions are fulfilled: A cell shall be considered detectable when

- P-CCPCH Ec/Io \geq -8 dB,
- DwPCH_Ec/Io \geq -5 dB.

When L3 filtering is used an additional delay can be expected.

When DRX or eDRX_CONN is in use, the UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements of at least 6 UTRA cells per UTRA TDD carrier for up to 3 UTRA TDD carriers and the UE physical

layer shall be capable of reporting measurements to higher layers with the measurement period $T_{measure_UTRA_TDD}$, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps. UE supporting Increased UE carrier monitoring UTRA shall be capable of performing UTRA TDD P-CCPCH RSCP measurements of at least 6 UTRA cells per UTRA TDD carrier for up to 7 UTRA TDD carriers with maximum of 80 cells consisting of at most 32 cells per frequency layer in the neighbour cell list. When DRX is used, $T_{measure_UTRA_TDD}$ is as defined in Table 8.1.2.4.3.2-2, and when eDRX_CONN is used, $T_{measure_UTRA_TDD}$ is as defined in Table 8.1.2.4.3.2-3.

T_{measure_UTRA_TDD} (s) (DRX cycles) T_{measure_UTRA_TDD} (s) (DRX cycles) DRX cycle (normal requirement) (reduced requirement) length (s) Gap period = 40Gap period = 80 Gap period = 40Gap period = 80ms ms ms ms ≤0.04 Non DRX Non DRX Non DRX Non DRX Requirements in Requirements in Requirements in Requirements in clause 8.1.2.4.3.1 clause 8.1.2.4.3.1 clause 8.1.2.4.3.1 clause 8.1.2.4.3.1 are applicable are applicable are applicable are applicable 0.8* K_r* N_{freq,r} 0.48*K_n*N_{freq,n} 0.48* K_r* N_{freq,r} 0.064 $0.8*K_n*N_{freq,n}$ (7.5* Kr* Nfreq,r) (12.5* Kr* Nfreq,r) (7.5*K_n *N_{freq,n}) (12.5*K_n *N_{freq,n}) 0.48*K_n *N_{freq,n} 0. 8*K_n *N_{freq,n} (10*K_n *N_{freq,n}) 0.48* K_r* N_{freq,r} 0.08 0. 8* Kr* Nfreq,r $(6*K_n *N_{freq,n})$ (6* K_r* N_{freq,r}) (10* K_r* N_{freq,r}) 0.128 0.64*K_n *N_{freq,n} 0. 8*K_n *N_{freq,n} 0.64* K_r* N_{freq,r} 0. 8* K_r* N_{freq,r} (6.2<u>5*</u> N_{freq,r}) (6.25*K_n *N_{freq,n}) (5*K_n *N_{freq,n}) (5* K_r* N_{freq,r}) 0. Note (5*Kn Note (5*Kn Note (5* K_r* Note (5* K_r* 128<DRX- $*N_{freq,n}$ *N_{freq,n}) $N_{freq,r}$ $N_{freq,r}$ cvcle≤2.56 Note: Time depends upon the DRX cycle in use

Table 8.1.2.4.3.2-2: Requirement to measure UTRA TDD cells

Table 8.1.2.4.3.2-3: Requirement to measure UTRA TDD cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{measure_UTRA_TDD} (s) (eDRX_CONN cycles) (normal requirement)		T _{measure_UTRA_TDD} (cycles) (reduce	(s) (eDRX_CONN ed requirement)
	Gap period = Gap period = 40 ms 80 ms		Gap period = 40 ms	Gap period = 80 ms
2.56 <edrx_conn< td=""><td>Note (5*K_n</td><td>Note (5*K_n</td><td>Note (5* K_r*</td><td>Note (5* K_r*</td></edrx_conn<>	Note (5*K _n	Note (5*K _n	Note (5* K _r *	Note (5* K _r *
cycle≤10.24	*N _{freq,n}) *N _{freq,n}) N _{freq,r}) N _{freq,r})			
Note: Time depends upon the eDRX_CONN cycle in use				

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.

8.1.2.4.3.2.1 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in clause 9.

8.1.2.4.3.2.2 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\,UTRA_TDD}$ defined in Clause 8.1.2.4.3.2 When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\, UTRA_TDD}$ defined in clause 8.1.2.4.3.2 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{measurement_UTRA_TDD}$ defined in clause 8.1.2.4.3.2 provided the timing to that cell has not changed more than \pm 10 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.4.3.2.3 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.4.3.2.2.

8.1.2.4.4 E-UTRAN FDD – UTRAN TDD measurements

The requirements in clause 8.1.2.4.3 also apply for this section.

8.1.2.4.5 E-UTRAN FDD – GSM measurements

8.1.2.4.5.1 E-UTRAN FDD – GSM measurements when no DRX is used

The requirements in this clause apply only to UE supporting E-UTRAN FDD and GSM.

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 is configured by E-UTRAN, or the UE supports capability of conducting such measurements without gaps, the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells.

8.1.2.4.5.1.1 GSM carrier RSSI

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in clause 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is $K_n*N_{freq,n}*480$ ms. The parameters $N_{freq,n}$ and K_n are defined in clause 8.1.2.1.1.

The UE shall meet the measurement accuracy requirements stated for RXLEV in [8], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

8.1.2.4.5.1.2 BSIC verification

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in clause 8.1.2.4.5.1.2.1.

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in clause 8.1.2.4.5.1.2.2.

If the network requests measurements on a GSM cell the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to clause 8.1.2.4.5.1 when a measurement gap pattern sequence is activated, or the UE supports capability of conducting such measurements without gaps.

The UE shall perform measurement reporting as defined in TS 36.331 [2].

- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [2].

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re-confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

 $T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

 $T_{\text{re-confirm,GSM}}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1.

Table 8.1.2.4.5.1.2-1: The gap length and maximum time difference for BSIC verification

Gap length [ms]	Maximum time difference [μs]
6	± 2350 μs

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in [9].

8.1.2.4.5.1.2.1 Initial BSIC identification

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in clause 8.1.2.4.5.1.2.

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification

failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

 $T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier. If interfrequency RSTD measurements are configured and the UE requires measurement gaps for performing such measurements, then $T_{identify,GSM}$ shall be based on the 80ms gap configuration.

T_{identify,gsm}(ms) T_{reconfirm,gsm}(ms) ceil(N_{freq,n} 40ms gap 80ms gap 40ms gap 80ms gap configuration configuration configuration configuration * K_n - M_{gsm} (ID 0) (ID 1) (ID 0) (ID 1) 0 2160 5280 1920 5040 1 5280 5040 17280 21760 2 5280 31680 5040 29280 No 3 19440 No requirement 13320 requirement No 4 31680 No requirement requirement 29280 No 5 31680 No requirement 29280 requirement

Table 8.1.2.4.5.1.2.1-1

8.1.2.4.5.1.2.2 BSIC re-confirmation

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement gap used for GSM BSIC reconfirmation as described in clause 8.1.2.4.5.1.2, the UE shall attempt to decode the BSIC falling within the measurement gap according to table 8.1.2.4.5.1.2.1-1. If more than one BSIC can be decoded within the same measurement gap, priority shall be given to the least recently decoded BSIC. If inter-frequency RSTD measurements are configured and the UE requires measurement gaps for performing such measurements, then $T_{\text{re-confirm},GSM}$ shall be based on the 80ms gap configuration.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-confirm},GSM}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see clause 8.1.2.4.5.1.2.1.

8.1.2.4.5.1.2a Enhanced BSIC verification

In addition to the BSIC verification requirements in clause 8.1.2.4.5.1.2, when the UE receives the GSM cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in [9] the BSIC identification requirement in table 8.1.2.4.5.1.2a-1 applies. The BSIC verification requirements in table 8.1.2.4.5.1.2a-1 shall apply when no DRX is used or when DRX cycle length $\leq 40 \text{ ms}$.

Table 8.1.2.4.5.1.2a-1

	T _{enhanced_ide}	_{ntify,gsm} (ms)	T _{enhanced_reco}	_{nfirm,gsm} (ms)
				40ms gap
		40ms gap		configuration
		configuration		when
		when		interfrequency
		interfrequency		RSTD
		RSTD		measurement
		measurement		is also
		is also		configured
		configured and		and the UE
		the UE requires		requires
		measurement		measurement
		gaps for		gaps for
ceil(N _{freq,n}	40ms gap	performing	40ms gap	performing
* K _n –	configuration	such	configuration	such
M _{gsm})	(ID 0)	measurements	(ID 0)	measurements
0	1320	2160	1080	1920

8.1.2.4.5.1.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in clause 9.

8.1.2.4.5.1.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period T_{Measurement Period, GSM} (see clause 8.1.2.4.5.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in clause 8.1.2.4.5.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.4.5.1.5 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.4.5.1.4.

8.1.2.4.5.2 E-UTRAN FDD – GSM measurements when DRX is used

The requirements in this clause apply only to UE supporting E-UTRAN FDD and GSM.

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 is configured by E-UTRAN, or the UE supports capability of conducting such measurements without gaps, the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX or eDRX_CONN periods the UE may use other periods of time outside the specified measurement gap patterns. The UE is not required to make measurements of GSM cells during DRX or eDRX_CONN periods if a measurement gap pattern has not been configured, unless the UE supports capability of conducting such measurements without gaps.

8.1.2.4.5.2.1 GSM carrier RSSI

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in clause 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{\text{GSM carrier RSSI}}$) per DRX or eDRX_CONN cycle. When DRX is used in RRC_CONNECTED state, the measurement period, $T_{\text{Measurement Period, GSM}}$, for the GSM carrier RSSI measurement is shown in table 8.1.2.4.5.2.1-1. When eDRX_CONN is used in RRC_CONNECTED state, the measurement period, $T_{\text{Measurement Period, GSM}}$, for the GSM carrier RSSI measurement is shown in table 8.1.2.4.5.2.1-2. The parameters $N_{\text{freq,n}}$ and K_{n} are defined in clause 8.1.2.1.1.

Table 8.1.2.4.5.2.1-1: GSM measurement period for large DRX

DRX cycle length (s)	T _{measure,GSM} (s) (DRX cycles)	
≤0.064	Non DRX Requirements are	
	applicable	
0.064 <drx-cycle≤< td=""><td>Note $(6*K_n*N_{freq,n})$</td></drx-cycle≤<>	Note $(6*K_n*N_{freq,n})$	
0.08	·	
$0.08 < DRX$ -cycle ≤ 2.56 Note $(5*K_n*N_{freq,n})$		
Note: Time depends upon the DRX cycle in use		

Table 8.1.2.4.5.2.1-2: GSM measurement period for large DRX when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{measure,GSM} (s) (eDRX_CONN cycles)	
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note $(5*K_n*N_{freq,n})$</td></edrx_conn>	Note $(5*K_n*N_{freq,n})$	
Note: Time depends upon the eDRX_CONN cycle in use		

The UE shall meet the measurement accuracy requirements stated for RXLEV in [8], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

8.1.2.4.5.2.2 BSIC verification

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells.
- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to clause 8.1.2.4.5.2.1 when a measurement gap pattern sequence is activated, or the UE supports capability of conducting such measurements without gaps.

The UE shall perform measurement reporting as defined in TS 36.331 [2].

- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.

- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [2].

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every 30 seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in [9].

8.1.2.4.5.2.2.1 Initial BSIC identification

This measurement shall be made on GSM cells that are requested with BSIC verified.

For DRX cycle length \leq 40 ms, the initial GSM BSIC identification requirements corresponding to the non DRX requirements as specified in clause 8.1.2.4.5.1.2.1 shall apply.

For DRX cycle length > 40 ms and any eDRX_CONN cycle, the UE shall make at least one attempt every $K_n*N_{freq,n}$ *30s to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $K_n*N_{freq,n}$ *60 s, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value. The parameters $N_{freq,n}$ and K_n are defined in clause 8.1.2.1.1.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

8.1.2.4.5.2.2.2 BSIC re-confirmation

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For DRX cycle length \leq 40 ms, the GSM BSIC re-conformation requirements corresponding to the non DRX requirements as specified in clause 8.1.2.4.5.1.2.2 shall apply.

For DRX cycle length > 40 ms and any eDRX_CONN cycle, at least every $K_n*N_{freq,n}*30$ seconds, the UE shall attempt to decode the BSIC of each identified GSM cell. If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $K_n*N_{freq,n}*60$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see clause 8.1.2.4.5.2.2.1. The parameters $N_{freq,n}$ and k_n are defined in clause 8.1.2.1.1.

8.1.2.4.5.2.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in clause 9.

8.1.2.4.5.2.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see clause 8.1.2.4.5.2.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in clause 8.1.2.4.5.2.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

8.1.2.4.5.2.5 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.4.5.2.4.

8.1.2.4.6 E-UTRAN TDD – GSM measurements

The requirements in clause 8.1.2.4.5 also apply for this section.

8.1.2.4.7 E-UTRAN FDD – UTRAN FDD measurements for SON

8.1.2.4.7.1 Identification of a new UTRA FDD cell for SON

No explicit neighbour list is provided to the UE for identifying a UTRA cell for SON. The UE shall identify and report only the strongest cell when requested by the network for the purpose of SON.

8.1.2.4.7.1.1 Requirements when no DRX is used

When no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new cell within:

$$\mathbf{T}_{\text{identify, UTRA_FDD}} = \mathbf{T}_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{\text{Tinter1}} \cdot K_{n} N_{\textit{freq,n}} \quad \textit{ms} \; (\text{normal performance})$$

and

$$T_{\text{identify, UTRA_FDD}} = T_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{\text{Tinter1}} \cdot K_r N_{\textit{freq,r}} \quad \textit{ms} \, (\text{reduced performance})$$

 $T_{basic_identify_UTRA_FDD} = 300$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- CPICH Ec/Io \geq -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA cell for SON within $8*T_{identify, UTRA_FDD}$ ms, the UE may stop searching UTRA cells for SON.

8.1.2.4.7.1.2 Requirements when DRX is used

When DRX or eDRX_CONN is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new cell within $T_{identify,\,UTRA_FDD}$. When DRX is used, $T_{identify,\,UTRA_FDD}$ is as defined in table 8.1.2.4.7.1.2-1, and when eDRX_CONN is used, $T_{identify,\,UTRA_FDD}$ is as defined in table 8.1.2.4.7.1.2-2.

Note $(25*K_r * N_{freq,r})$

Tidentify, UTRA_FDD (s) (DRX cycles) (normal Tidentify, UTRA_FDD (s) (DRX cycles) (reduced DRX cycle length requirement) requirement) (s) Gap period = 80 ms Gap period = 40 ms Gap period = 80 ms Gap period = 40 ms ≤0.04 Non DRX Non DRX Non DRX Non DRX Requirements in Requirements in Requirements in Requirements in clause 8.1.2.4.7.1.1are clause 8.1.2.4.7.1.1 clause 8.1.2.4.7.1.1are clause 8.1.2.4.7.1.1 applicable are applicable applicable are applicable 0.04<DRX Note (45*K_n* N_{freq.n}) Note (95*K_n * N_{freg,n}) Note (45*K_r* N_{freg.r}) Note (95*K_r * N_{freq.r}) cycle≤0.08 0.128 3.84*K_n * N_{freq,n} (30*K_n 8.0*K_n * N_{freq,n} 3.84*K_r * N_{freq,r} (30*K_r * 8.0*K_r * N_{freq,r} (62.5*K_r * N_{freq,r}) * N_{freq,n}) (62.5*K_n * N_{freq,n}) $N_{freq,r}$ 0.16 4.0*K_n * N_{freq,n} (25*K_n 8.0*K_n * N_{freq,n} (50*K_n 4.0*K_r * N_{freq,r} (25*K_r * 8.0*K_r * N_{freq,r} (50*K_r * * N_{freq,n}) $N_{freq,n}$ $N_{freq,r}$ $N_{freq,r}$ 6.4*K_r * N_{freq,r} (25*K_r 8.96*K_r * N_{freq,r} (35*K_r 0.256 6.4*K_n * N_{freq,n} (25*K_n 8.96*K_n * N_{freq,n} (35*K_n * N_{freq,n}) * N_{freq,r}) $N_{freq,r}$ $N_{freq,n}$ 8.96*K_n * N_{freq,n} (28*K_n * N_{freq,n}) 8*K_n * N_{freq,n} (25*K_n * 8*K_r * N_{freq,r} (25*K_r * 8.96*K_r * N_{freq,r} (28*K_r 0.32 * $N_{freq,r}$) $N_{freq,n}$ $N_{freq,r}$

Table 8.1.2.4.7.1.2-1: Requirement to identify a new UTRA FDD cell for SON

Table 8.1.2.4.7.1.2-2: Requirement to identify a new UTRA FDD cell for SON when eDRX_CONN cycle is used

Note (25*K_n * N_{freq,n})

Note $(25*K_r * N_{freq,r})$

eDRX_CONN	T _{identify, UTRA_FDD} (s) (eDRX_CONN cycles)		Tidentify, UTRA_FDD (s) (eDRX_CONN cycles)	
cycle length (s)	(normal requirement)		(reduced re	quirement)
	Gap period = 40 ms Gap period = 80 ms		Gap period = 40 ms	Gap period = 80 ms
2.56 <edrx_conn< td=""><td>Note (25*K_n * N_{freq.n})</td><td>Note (25*K_n * N_{freq,n})</td><td>Note (25*K_r * N_{freq,r})</td><td>Note (25*K_r * N_{freq,r})</td></edrx_conn<>	Note (25*K _n * N _{freq.n})	Note (25*K _n * N _{freq,n})	Note (25*K _r * N _{freq,r})	Note (25*K _r * N _{freq,r})
cycle≤10.24				
Note: Time depends upon the eDRX_CONN cycle in use				

A cell shall be considered identifiable provided following conditions are fulfilled:

Note (25 $*K_n * N_{freq,n}$)

Note: Time depends upon the DRX cycle in use

- CPICH Ec/Io \geq -20 dB,

0.32<DRX

cycle≤2.56

 SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA cell for SON within $8*T_{identify, UTRA_FDD}$ seconds, the UE may stop searching UTRA cells for SON; when DRX is used $T_{identify, UTRA_FDD}$ is defined in table 8.1.2.4.7.1.2-1, and when eDRX_CONN is used $T_{identify, UTRA_FDD}$ is defined in table 8.1.2.4.7.1.2-2.

8.1.2.4.7.1.3 Reporting Delay

The UE shall not report the physical cell identity of an identifiable cell for SON as long as the reporting criteria are not fulfilled.

The reporting delay is defined as the time between the identification of the strongest cell for SON until the UE starts to transmit its physical cell identity over the Uu interface. This requirement assumes that the reporting of the physical cell identity is not delayed by other RRC signalling on the DCCH. This reporting delay excludes a delay uncertainty resulted when inserting the physical cell identity of the strongest cell for SON to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This reporting delay excludes any delay caused by unavailability of UL resources for UE sending the physical cell identity of the strongest cell for SON.

The reporting delay of the physical cell identity of the strongest cell for SON without L3 filtering shall be less than $T_{identify,\,UTRA_FDD}$ defined in clause 8.1.2.4.7.1.1 and in clause 8.1.2.4.7.1.2 for non DRX and DRX or eDRX_CONN cases respectively. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.4.8 E-UTRAN TDD – UTRAN FDD measurements for SON

The requirements in clause 8.1.2.4.7 also apply for this section.

8.1.2.4.9 E-UTRAN FDD – cdma2000 1xRTT measurements

UE shall perform cdma2000 1xRTT measurements according to the procedure defined in [15] on the cdma2000 1xRTT neighbor cells indicated by the serving eNode B. If measurement gaps are required, the UE shall perform cdma2000 1xRTT measurements only during the measurement gaps configured by the serving eNode B.

8.1.2.4.9.1A E-UTRAN FDD – cdma2000 1xRTT measurements when no DRX is used

When measurement gaps are scheduled for CDMA2000 1xRTT inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CDMA2000 1xRTT Pilot Strength measurements to higher layers with measurement accuracy as specified in Clause 9.5, corresponding to a 90% measurement success rate, with measurement period given by

$$\mathbf{T}_{\text{measurement_CDMA2000_1x}} = \mathbf{T}_{\text{basic_measurement_CDMA2000_1x}} \cdot \boldsymbol{N}_{\textit{freq,n}} \cdot \boldsymbol{K}_{n} \cdot \boldsymbol{S}_{\textit{gap}}$$

where $T_{basic_measurement_CDMA2000_1x} = 100$ ms and the measurement gap specific scale factor S_{gap} is based on the measurement gap pattern in use as defined in Table 8.1.2.4.9.1-1. If inter-frequency RSTD measurements are configured and the UE requires measurement gaps for performing such measurements, then S_{gap} shall be based to the Gap Pattern Id 1.

Table 8.1.2.4.9.1-1: Gap Pattern Specific Scale Factor

Gap Pattern Id	S _{gap}
0	32/3
1	64/3

8.1.2.4.9.1 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in clause 9.

The measurement reporting delay of each periodic report is defined as the time between the end of the last measurement period and the moment when the UE starts to transmit the measurement report over the Uu interface. This delay shall be less than T_{71m} defined in [15] for each periodic report. This measurement reporting delay excludes a delay which is caused by the unavailability of the uplink resources for the UE to send the measurement report.

8.1.2.4.10 E-UTRAN TDD – cdma2000 1xRTT measurements

The requirements in clause 8.1.2.4.9 also apply for this section.

8.1.2.4.11 E-UTRAN FDD – HRPD measurements

UE shall perform HRPD measurements according to the procedure defined in [11] on the HRPD neighbor cells indicated by the serving eNode B. If measurement gaps are required, the UE shall perform HRPD measurements only during the measurement gaps configured by the serving eNode B.

8.1.2.4.12 E-UTRAN TDD – HRPD measurements

The requirements in clause 8.1.2.4.11 also apply for this section.

8.1.2.4.13 E-UTRAN TDD – UTRAN TDD measurements for SON

8.1.2.4.13.1 Identification of a new UTRA TDD cell for SON

No explicit neighbour list is provided to the UE for identifying a UTRA TDD cell for SON. The UE shall identify and report only the strongest cell when requested by the network for the purpose of SON.

8.1.2.4.13.1.1 Requirements when no DRX is used

When no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new cell within:

$$T_{\text{identify, UTRA_TDD}} = T_{\text{basic_identify_UTRA_TDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_n \cdot N_{freq,n} \quad ms \text{ (normal performance)}$$

and

$$\mathbf{T}_{\text{identify, UTRA_TDD}} = \mathbf{T}_{\text{basic_identify_UTRA_TDD}} \cdot \frac{480}{\mathbf{T}_{\text{interl}}} \cdot K_r \cdot N_{\textit{freq,r}} \quad \textit{ms} \; (\text{reduced performance})$$

 $T_{basic_identify_UTRA_TDD} = 800$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- P-CCPCH Ec/Io \geq -8 dB,
- DwPCH_Ec/Io \geq -5 dB.

When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA TDD cell for SON within 8*T_{identify, UTRA_TDD} ms, the UE may stop searching UTRA TDD cells for SON.

8.1.2.4.13.1.2 Requirements when DRX is used

When DRX or eDRX_CONN is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new cell within $T_{identify,\,UTRA_TDD}$. When DRX is used, $T_{identify,\,UTRA_TDD}$ is as defined in table 8.1.2.4.13.1.2-1, and when eDRX_CONN is used, $T_{identify,\,UTRA_TDD}$ is as defined in table 8.1.2.4.13.1.2-2.

Table 8.1.2.4.13.1.2-1: Requirement to identify a new UTRA TDD cell for SON

DRX cycle length (s)	T _{identify} , UTRA_TDD (s) (DRX cycles)		T _{identify, UTRA_TDD} (s) (DRX cycles)	T _{identify, UTRA_TDD} (s) (DRX cycles)
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX	Non DRX	Non DRX	Non DRX
	Requirements in	Requirements in	Requirements in	Requirements in
	clause 8.1.2.4.3.1	clause 8.1.2.4.3.1 are	clause 8.1.2.4.3.1 are	clause 8.1.2.4.3.1 are
	are applicable	applicable	applicable	applicable
0.16 <drx< td=""><td>Note (25*K_n* N_{freq,n})</td><td>Note (50*K_n * N_{freq,n})</td><td>Note (25*K_r* N_{freq,r})</td><td>Note (50*K_r * N_{freq,r})</td></drx<>	Note (25*K _n * N _{freq,n})	Note (50*K _n * N _{freq,n})	Note (25*K _r * N _{freq,r})	Note (50*K _r * N _{freq,r})
cycle≤0.256	•	•	·	·
0.256 <drx< td=""><td>Note $(25*K_n * N_{freq,n})$</td><td>Note (45*K_n * N_{freq,n})</td><td>Note (25$*K_r * N_{freq,r}$)</td><td>Note (45$*K_r * N_{freq,r}$)</td></drx<>	Note $(25*K_n * N_{freq,n})$	Note (45*K _n * N _{freq,n})	Note (25 $*K_r * N_{freq,r}$)	Note (45 $*K_r * N_{freq,r}$)
cycle≤0.32				
0.32 <drx< td=""><td>Note (25*K_n * N_{freq,n})</td><td>Note (25*K_n * N_{freq,n})</td><td>Note (25*K_r * N_{freq,r})</td><td>Note (25*K_r * N_{freq,r})</td></drx<>	Note (25*K _n * N _{freq,n})	Note (25*K _n * N _{freq,n})	Note (25*K _r * N _{freq,r})	Note (25*K _r * N _{freq,r})
cycle≤2.56	, 11	,	,	,
Note: Time	Note: Time depends upon the DRX cycle in use			

Table 8.1.2.4.13.1.2-2: Requirement to identify a new UTRA TDD cell for SON when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{identify} , UTRA_TDD (s) (eDRX_CONN cycles)		T _{identify} , utra_tdd (s) (eDRX_CONN cycles)	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
2.56 <edrx_conn cycle≤10.24</edrx_conn 	Note (25*K _n * N _{freq,n})	Note (25*K _n * N _{freq,n})	Note (25*K _r * N _{freq,r})	Note (25*K _r * N _{freq,r})
Note: Time depends upon the eDRX_CONN cycle in use				

A cell shall be considered identifiable provided following conditions are fulfilled:

- P-CCPCH Ec/Io \geq -8 dB,
- DwPCH Ec/Io > -5 dB.

When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA TDD cell for SON within $8*T_{identify, UTRA_TDD}$ seconds, the UE may stop searching UTRA TDD cells for SON; when DRX is used $T_{identify, UTRA_TDD}$ is defined in table 8.1.2.4.13.1.2-1, and when eDRX_CONN is used $T_{identify, UTRA_TDD}$ is defined in table 8.1.2.4.13.1.2-2.

8.1.2.4.13.1.3 Reporting Delay

The UE shall not report the physical cell identity of an identifiable cell for SON as long as the reporting criteria are not fulfilled.

The reporting delay is defined as the time between the identification of the strongest cell for SON until the UE starts to transmit its physical cell identity over the Uu interface. This requirement assumes that the reporting of the physical cell identity is not delayed by other RRC signalling on the DCCH. This reporting delay excludes a delay uncertainty resulted when inserting the physical cell identity of the strongest cell for SON to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This reporting delay excludes any delay caused by unavailability of UL resources for UE sending the physical cell identity of the strongest cell for SON.

The reporting delay of the physical cell identity of the strongest cell for SON without L3 filtering shall be less than $T_{identify,\,UTRA_TDD}$ defined in clause 8.1.2.4.13.1.1 and in clause 8.1.2.4.13.1.2 for non DRX and DRX and eDRX_CONN cases respectively. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.4.14 E-UTRAN FDD – UTRAN TDD measurements for SON

The requirements in clause 8.1.2.4.13 also apply for this section.

8.1.2.4.15 E-UTRAN FDD – cdma2000 1xRTT measurements for SON ANR

8.1.2.4.15.1 Identification of a new cdma2000 1xRTT cell for SON ANR

No explicit neighbour list is provided to the UE for identifying a cdma2000 1xRTT cell for SON ANR. The UE shall identify and report only the strongest cell when requested by the network for the purpose of SON ANR.

8.1.2.4.15.1.1 Requirement when no DRX is used

When measurement gaps are scheduled for CDMA2000 1xRTT inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CDMA2000 1xRTT Pilot Strength measurements to higher layers with measurement accuracy as specified in Clause 9.5, corresponding to a 90% measurement success rate, with measurement period given by

$$\mathbf{T}_{\text{measurement_CDMA2000_1x}} = \mathbf{T}_{\text{basic_measurement_CDMA2000_1x}} \cdot N_{\textit{freq,n}} \cdot K_n \cdot S_{\textit{gap}}$$

where $T_{basic_measurement_CDMA2000_1x} = 100$ ms and the measurement gap specific scale factor S_{gap} is based on the measurement gap pattern in use as defined in Table 8.1.2.4.15.1.1-1. If inter-frequency RSTD measurements are configured and the UE requires measurement gaps for performing such measurements, then S_{gap} shall be based to the Gap Pattern Id 1.

Table 8.1.2.4.15.1.1-1: Gap Pattern Specific Scale Factor

Gap Pattern Id	S _{gap}
0	32/3
1	64/3

If the UE is unable to identify the CDMA2000 1xRTT cell for SON ANR within [TBD] ms, the UE may stop searching CDMA2000 1xRTT cells for SON ANR.

8.1.2.4.15.1.2 Reporting Delay

The UE shall not report the physical cell identity of an identifiable cell for SON ANR as long as the reporting criteria are not fulfilled.

The reporting delay is defined as the time between the identification of the strongest cell for SON ANR until the UE starts to transmit its physical cell identity over the Uu interface. This delay shall be less than T_{71m} defined in [15]. This measurement reporting delay excludes a delay which is caused by the unavailability of the uplink resources for the UE to send the measurement report.

8.1.2.4.16 E-UTRAN TDD – cdma2000 1xRTT measurements for SON ANR

The requirements in clause 8.1.2.4.15 also apply for this section.

8.1.2.4.17 E-UTRAN FDD-UTRAN FDD measurements with autonomous gaps

The requirements in this clause apply only to UE supporting E-UTRA FDD and UTRA FDD.

8.1.2.4.17.1 Identification of a new CGI of UTRA FDD cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of UTRA FDD cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for decoding SFN and receiving UTRAN MIB and SIB3 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, the UE shall be able to identify a new CGI of UTRA FDD cell within:

$$T_{identify_CGI, UTRAN FDD} = 630 + 40*SIB3 REP ms$$

where SIB3_REP is the repetition period at which the UTRAN cell schedules SIB3 blocks in units of frames specified in TS 25.331 [7], provided that the UTRAN cell has been already identified by the UE.

This requirement is applicable for UTRA FDD target cell configurations where the information required to make the SI report can be determined from the MIB and SIB3 alone, and MIB and SIB3 are not segmented into multiple TTIs. Additionally, for the requirement to be applicable, the reception conditions shall be such that the system frame number of the target UTRA FDD cell, the MIB and SIB3 can each be successfully decoded in no more than four attempts.

According to the reception conditions:

A cell shall be considered identifiable following conditions are fulfilled:

- CPICH Ec/Io > -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected. The system frame number, the MIB and SIB3 of the target cell shall be considered decodable provided the BCH demodulation requirements are met according to [29].

The requirement for identifying a new CGI of an UTRA FDD cell within $T_{identify_CGI,\,UTRAN\,FDD}$ is applicable when no DRX is used as well as when any of the DRX or eDRX_CONN cycles specified in TS 36.331 [2] is used.

8.1.2.4.17.2 CGI Reporting Delay

The CGI reporting delay occurs due to the delay uncertainty when inserting the CGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the CGI reporting may be delayed until the next DRX cycle. In case eDRX is used, the CGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.4.18 E-UTRAN TDD-UTRAN FDD measurements with autonomous gaps

The requirements in this clause apply only to UE supporting E-UTRA TDD and UTRA FDD.

8.1.2.4.18.1 Identification of a new CGI of UTRA FDD cell with autonomous gaps

The requirements in clause 8.1.2.4.17.1 also apply for this section.

8.1.2.4.18.2 CGI Reporting Delay

The requirements in clause 8.1.2.4.17.2 also apply for this section.

8.1.2.4.19 E-UTRAN FDD – WLAN measurements

8.1.2.4.19.1 Introduction

The requirements in this section shall apply for a UE capable of E-UTRA FDD and LTE-WLAN Aggregation [2].

8.1.2.4.19.2 Requirements

8.1.2.4.19.2.1 E-UTRAN FDD – WLAN measurements when no DRX is used

In the RRC_CONNECTED state when no DRX is used the measurement period for WLAN RSSI shall be T_{WLAN_RSSI} as defined in table 8.1.2.4.19.2.1-1.

The value of T_{WLAN_RSSI} depends upon whether the WLAN RSSI measurement is performed on the serving access point (AP) or on a neighbour AP and in case of the neighbour AP whether the neighbour AP is known or unknown to the UE:

- Measurement of known single neighbor AP is time-sensitive and is performed on the AP for which information about the operating channel is known to the UE; and
- Measurement of unknown neighbor AP is not time-sensitive and is performed on the AP for which information about the operating channel is not known to the UE.

The UE shall be capable of performing WLAN RSSI measurements for certain minimum number of APs during T_{WLAN_RSSI} as defined in table 8.1.2.4.19.2.1-1 provided that the beacon frame of the measured AP is available at the UE at least once every 102.4 ms. The UE physical layer shall be capable of reporting WLAN RSSI measurements to higher layers with the measurement period of T_{WLAN_RSSI} .

Table 8.1.2.4.19.2.1-1: WLAN RSSI measurement period

WLAN RSSI measurement con	T _{WLAN_RSSI} [seconds]	
Type of Measurement	Minimum number of APs measured during T _{WLAN_RSSI}	
Measurement of serving AP	1	0.5
Measurement of known neighbor AP on a single channel	1	5
Measurement of multiple unknown neighbor APs	3	30

The WLAN RSSI measurement accuracy for all measured access points shall be fulfilled according to the accuracy as specified in the sub-clause 9.7.1.

8.1.2.4.19.2.2 E-UTRAN FDD – WLAN measurements when DRX is used

In the RRC_CONNECTED state when DRX is used the measurement period for WLAN RSSI shall be T_{RSSI_DRX} as defined in table 8.1.2.4.19.2.2-1.

The value of $T_{WLAN_RSSI_DRX}$ depends upon whether the WLAN RSSI measurement is performed on the serving access point (AP) or on a neighbour AP and in case of the neighbour AP whether the neighbour AP is known or unknown to the UE:

- Measurement of known single neighbor AP is time-sensitive and is performed on the AP for which information about the operating channel is known to the UE; and
- Measurement of unknown neighbor AP is not time-sensitive and is performed on the AP for which information about the operating channel is not known to the UE

The UE shall be capable of performing WLAN RSSI measurements for certain minimum number of APs during $T_{WLAN_RSSI_DRX}$ as defined in table 8.1.2.4.19.2.2-1 provided that the beacon frame of the measured AP is available at the UE at least once every 102.4 ms. The UE physical layer shall be capable of reporting WLAN RSSI measurements to higher layers with the measurement period of $T_{WLAN_RSSI_DRX}$.

Table 8.1.2.4.19.2.2-1: Requirement to measure WLAN RSSI in DRX

WLAN RSSI measurement configuration		DRX cycle length (s)	T _{WLAN_RSSI_DRX} (s)
Type of Measurement	Minimum number of APs measured during T _{WLAN_RSSI}		
Measurement of serving AP	1	0.002 ≤ DRX-cycle ≤ 0.320	MAX (0.5, 5*L _{DRX})
Measurement of one known		0.002 ≤ DRX-cycle ≤ 0.320	MAX (5, 25*L _{DRX})
neighbor AP on a single channel	1	0.320 < DRX-cycle ≤ 2.56	MAX (5, 20*L _{DRX})
Measurement of 3 unknown	2	0.002 ≤ DRX-cycle ≤ 0.320	MAX (30, 150*L _{DRX})
neighbor APs	3	0.320 < DRX-cycle ≤ 2.56	MAX (30, 120*L _{DRX})
Note 1: L _{DRX} is the length of DRX cycle in second(s)			

The WLAN RSSI measurement accuracy for all measured access points shall be fulfilled according to the accuracy as specified in the sub-clause 9.7.1.

8.1.2.4.19.2.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in clause 9.7.1.

8.1.2.4.19.2.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in clause 9.7.1.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T_{WLAN_RSSI} when no DRX is used as defined in section 8.1.2.4.19.2.1 and $T_{WLAN_RSSI_DRX}$ when DRX is used as defined in section 8.1.2.4.19.2.2. When L3 filtering is used or IDC autonomous denial or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, is configured an additional delay can be expected.

8.1.2.4.19.2.5 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.7.1.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.4.19.2.3.

8.1.2.4.20 E-UTRAN TDD – WLAN measurements

The requirements in this section shall apply for a UE capable of E-UTRA TDD and LTE-WLAN Aggregation [2]. The requirements in clause 8.1.2.4.19 also apply for this section.

8.1.2.5 E-UTRAN OTDOA Intra-Frequency RSTD Measurements

All intra-frequency RSTD measurement requirements specified in Sections 8.1.2.5.1 and 8.1.2.5.2 shall apply without DRX as well as for any DRX and eDRX_CONN cycles specified in TS 36.331 [2].

8.1.2.5.1 E-UTRAN FDD Intra-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure intra-frequency RSTD, specified in TS 36.214 [4], for at least n=16 cells, including the reference cell, on the same carrier frequency f1 as that of the reference cell within

 $T_{RSTD\ IntraFreqFDD,\ E-UTRAN}$ ms as given below (see also Figure 8.1.2.5.1-1):

$$T_{RSTD IntraFreqFDD, E-UTRAN} = T_{PRS} \cdot (M-1) + \Delta$$
 ms

where

 $T_{RSTD\ IntraFreqFDD,\ E-UTRAN}$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the cell-specific positioning subframe configuration period as defined in TS 36.211 [16],

M is the number of PRS positioning occasions as defined in Table 8.1.2.5.1-1, where each PRS positioning occasion comprises of N_{PRS} (1 $\leq N_{PRS} \leq$ 6) consecutive downlink positioning subframes defined in TS 36.211 [16], and

 $\Delta = 160 \cdot \left\lceil \frac{n}{M} \right\rceil$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time

and the processing time.

Table 8.1.2.5.1-1: Number of PRS positioning occasions within $T_{RSTD\;IntraFreqFDD,\;E-UTRAN}$

Positioning subframe	Number of PRS positioning occasions M		
configuration period $T_{ m PRS}$	f1 Note1	f1 and f2 Note2	
160 ms	16	32	
>160 ms	8	16	

Note 1: When only intra-frequency RSTD measurements are performed over cells belonging to the serving FDD carrier frequency f1.

Note 2. When intra-frequency RSTD and inter-frequency RSTD measurements are performed over cells belonging to the serving FDD carrier frequency f1 and one inter-frequency carrier frequency f2, respectively.

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{RSTD \, IntraFreoFDD, E-UTRAN}$ provided:

 $(PRS \hat{E}_s / Iot)_{ref} \ge -6 dB$ for all Frequency Bands for the reference cell,

 $(PRS \hat{E}_s / Iot)_i \ge -13 \text{ dB for all Frequency Bands for neighbour cell } i$,

 $\left(\text{PRS } \hat{\mathbf{E}}_{s} / \text{Iot} \right)_{ref}$ and $\left(\text{PRS } \hat{\mathbf{E}}_{s} / \text{Iot} \right)_{i}$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning

occasions,

PRP 1,2|dBm according to Annex B.2.5 for a corresponding Band

 $PRS \, \hat{E}_s$ / Iot is defined as the ratio of the average received energy per PRS RE during the useful part of the symbol to the average received power spectral density of the total noise and interference for this RE, where the ratio is measured over all REs which carry PRS.

The time $T_{RSTD\,IntraFreqFDD,\,E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in TS 36.355 [24], are delivered to the physical layer of the UE as illustrated in Figure 8.1.2.5.1-1.

The RSTD measurement accuracy for all measured neighbor cells *i* shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.1.

If the intra-frequency handover occurs while intra-frequency RSTD measurements are being performed then the UE shall complete the ongoing OTDOA measurement session. The UE shall also meet the intra-frequency OTDOA measurement and accuracy requirements. However in this case the RSTD measurement period

($T_{\text{RSTD IntraFreqFDD, E-UTRAN, HO}}$) shall be according to the following expression:

$$\mathbf{T}_{\text{RSTD IntraFreqFDD, E-UTRAN, HO}} = \mathbf{T}_{\text{RSTD IntraFreqFDD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{HO}} \qquad \textit{ms} \; ,$$

where:

K is the number of times the intra-frequency handover occurs during $T_{\text{RSTD IntraFreqFDD, E-UTRAN, HO}}$.

 $T_{\rm HO}$ is the time during which the intra-frequency RSTD measurement may not be possible due to intra-frequency handover; it can be up to 45 ms.

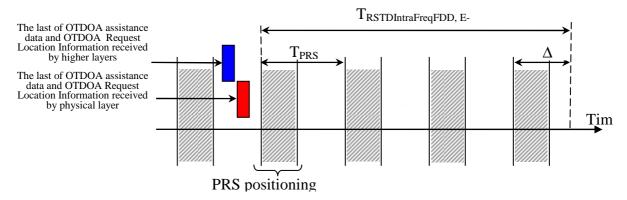


Figure 8.1.2.5.1-1. Illustration of the RSTD reporting time requirement in an FDD system.

Furthermore, due to the intra-frequency handover the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of all the PCells during the RSTD measurement period.

8.1.2.5.1.1 RSTD Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.5.2 E-UTRAN TDD Intra-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure intra-frequency RSTD, specified in TS 36.214 [4], for at least n=16 cells, including the reference cell, on the same carrier frequency f1 as that of the reference cell within

 $T_{RSTD\ IntraFreqTDD,\ E-UTRAN}$ ms as given below:

$$T_{RSTD IntraFreqTDD, E-UTRAN} = T_{PRS} \cdot (M-1) + \Delta$$
 ms

where

 $T_{RSTD\ Intra}FreqTDD\ E-UTRAN$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the cell-specific positioning subframe configuration period as defined in TS 36.211 [16],

 $\it M$ is the number of PRS positioning occasions as defined in Table 8.1.2.5.2-1, where a PRS positioning occasion is as defined in Clause 8.1.2.5.1, and

 $\Delta = 160 \cdot \left\lceil \frac{n}{M} \right\rceil$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time and the processing time.

Table 8.1.2.5.2-1: Number of PRS positioning occasions within $T_{RSTD\;IntraFreqTDD,\;E-UTRAN}$

Positioning subframe	Number of PRS positioning occasions M		
configuration period $T_{ m PRS}$	f1 Note1	f1 and f2 Note2	
160 ms	16	32	
>160 ms	8	16	

Note 1: When only intra-frequency RSTD measurements are performed over cells belonging to the serving TDD carrier frequency f1.

Note 2: When intra-frequency RSTD and inter-frequency RSTD measurements are performed over cells belonging to the serving TDD carrier frequency f1 and one inter-frequency carrier frequency f2 respectively.

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{\text{RSTD IntraFreqTDD, E-UTRAN}}$ provided:

 $(PRS \hat{E}_s / Iot)_{ref} \ge -6 dB$ for all Frequency Bands for the reference cell,

 $(PRS \hat{E}_s / Iot)_i \ge -13 dB$ for all Frequency Bands for neighbour cell i,

$$\left(\text{PRS } \hat{\mathbf{E}}_{s} / \text{Iot} \right)_{ref}$$
 and $\left(\text{PRS } \hat{\mathbf{E}}_{s} / \text{Iot} \right)_{i}$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning

occasions,

PRP 1,2|dBm according to Annex B.2.5 for a corresponding Band

PRS \hat{E}_s / Iot is as defined in Clause 8.1.2.5.1.

The time $T_{RSTD\,IntraFreqTDD,\,E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in TS 36.355 [24], are delivered to the physical layer of the UE.

The RSTD measurement accuracy for all measured neighbor cells i shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.1.

If the intra-frequency handover occurs while intra-frequency RSTD measurements are being performed then the UE shall complete the ongoing OTDOA measurement session. The UE shall also meet the intra-frequency OTDOA measurement and accuracy requirements. However in this case the RSTD measurement period

($T_{\text{RSTD IntraFreqTDD, E-UTRAN, HO}}$) shall be according to the following expression:

$$T_{RSTD\ IntraFreqTDD,\ E-UTRAN,\ HO} = T_{RSTD\ IntraFreqTDD,\ E-UTRAN} + K \times T_{PRS} + T_{HO}$$
 ms

where:

K is the number of times the intra-frequency handover occurs during $T_{\text{RSTD IntraFreqTDD, E-UTRAN, HO}}$,

 $T_{\rm HO}$ is the time during which the intra-frequency RSTD measurement may not be possible due to intra-frequency handover; it can be up to 45 ms.

Furthermore, due to the intra-frequency handover the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of all the PCells during the RSTD measurement period.

The intra-frequency requirements in this clause (8.1.2.5.2) shall apply for all TDD special subframe configurations specified in TS 36.211 [16] and for the TDD uplink-downlink configurations as specified in Table 8.1.2.5.2-2.

Table 8.1.2.5.2-2: TDD uplink-downlink subframe configurations applicable for TDD intra-frequency requirements

PRS Transmission Bandwidth [RB]	Applicable TDD uplink-downlink configurations
6, 15	1, 2, 3, 4 and 5
25, 50, 75, 100	0, 1, 2, 3, 4, 5 and 6
Note: Uplink-downlink configurations are sp	pecified in Table 4.2-2 in TS 36.211 [16].

8.1.2.5.2.1 RSTD Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.6 E-UTRAN Inter-Frequency OTDOA Measurements

All inter-frequency RSTD measurement requirements specified in Sections 8.1.2.6.1-8.1.2.6.4 shall apply, provided that

- the UE is capable of inter-frequency RSTD measurements for OTDOA [24], and
- either the measurement gap pattern ID # 0 specified in Clause 8.1.2.1 is used or the UE supports capability of conducting inter-frequency measurements without gaps.

All inter-frequency RSTD measurement requirements specified in Sections 8.1.2.6.1-8.1.2.6.4 shall apply without DRX as well as for any DRX or eDRX_CONN cycles specified in TS 36.331 [2].

8.1.2.6.1 E-UTRAN FDD-FDD Inter-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure inter-frequency RSTD, specified in TS 36.214 [4], for at least n=16 cells, including the reference cell, within $T_{RSTD InterFreqFDD, E-UTRAN}$ ms as given below:

$$T_{\text{RSTD InterFreqFDD, E-UTRAN}} = T_{\text{PRS}} \cdot (M - 1) + \Delta$$
 ms

where

 $T_{RSTD\ InterFreqFDD,\ E-UTRAN}$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the the largest value of the cell-specific positioning subframe configuration period, defined in TS 36.211 [16], among the measured n cells including the reference cell,

M is the number of PRS positioning occasions as defined in Table 8.1.2.6.1-1, where a PRS positioning occasion is as defined in clause 8.1.2.5.1,

$$\Delta = 160 \cdot \left[\frac{n}{M} \right]$$
 ms is the measurement time for a single PRS positioning occasion which includes the sampling time

and the processing time, and

the n cells are distributed on up to two carrier frequencies including a serving carrier frequency and one inter-frequency carrier.

Table 8.1.2.6.1-1: Number of PRS positioning occasions within $T_{RSTD\;InterFreqFDD,\;E-UTRAN}$

Positioning subframe	Number of PRS p	ositioning occasions $\it M$
configuration period $T_{ m PRS}$	f2 Note1	f1 and f2 Note2
160 ms	16	32
>160 ms	8	16

Note 1: When inter-frequency RSTD measurements are performed over the reference cell and neighbour cells, which belong to the FDD inter-frequency carrier frequency f2.

Note 2: When inter-frequency RSTD measurements are performed over the reference cell and the neighbour cells, which belong to the serving FDD carrier frequency f1 and the FDD inter-frequency carrier frequency f2 respectively.

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{\text{RSTD InterFreqFDD, E-UTRAN}}$ provided:

 $(PRS \hat{E}_s / Iot)_{ref} \ge -6 dB$ for all Frequency Bands for the reference cell,

 $(PRS \, \hat{E}_s / Iot)_i \ge 13 \, dB$ for all Frequency Bands for neighbour cell i,

 $\left(\text{PRS } \hat{\mathbf{E}}_{\text{s}} / \text{Iot} \right)_{\text{ref}}$ and $\left(\text{PRS } \hat{\mathbf{E}}_{\text{s}} / \text{Iot} \right)_{i}$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning

occasions,

PRP 1,2|dBm according to Annex B.2.6 for a corresponding Band

PRS \hat{E}_s / Iot is as defined in Clause 8.1.2.5.1.

The time $T_{RSTD\,InterFreqFDD,\,E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in TS 36.355 [24], are delivered to the physical layer of the UE.

If the inter-frequency handover occurs while inter-frequency RSTD measurements are being performed, and the inter-frequency carrier on which RSTD is measured becomes the new serving carrier frequency after the inter-frequency handover, the UE shall complete the ongoing OTDOA measurement session. The UE shall also meet the inter-frequency OTDOA measurement and accuracy requirements. However in this case the RSTD measurement period ($T_{RSTD\ InterFreqFDD,\ E-UTRAN,\ HO}$) shall be according to the following expression:

$$\mathbf{T}_{\text{RSTD InterFreqFDD, E-UTRAN, HO}} = \mathbf{T}_{\text{RSTD InterFreqFDD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{HO}} \qquad \textit{ms} \; ,$$

where:

K is the number of times the inter-frequency handover occurs during $T_{\text{RSTD InterFreqFDD, E-UTRAN, HO}}$,

 $T_{\rm HO}$ is the time during which the inter-frequency RSTD measurement may not be possible due to inter-frequency handover; it can be up to 45 ms.

The RSTD measurement accuracy for all measured neighbor cells i shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.2.

Furthermore, due to the inter-frequency handover the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of those PCells on whose carriers RSTD measurement is performed during the RSTD measurement period.

8.1.2.6.1.1 RSTD Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.6.2 E-UTRAN TDD-FDD Inter-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure inter-frequency RSTD, specified in TS 36.214 [4], for at least n=16 cells,

including the reference cell, within $T_{RSTD InterFreqTDDFDD, E-UTRAN}$ ms as given below:

$$T_{\text{RSTD InterFreqTDDFDD, E-UTRAN}} = T_{\text{PRS}} \cdot (M - 1) + \Delta$$
 ms

where

 $T_{RSTD\ InterFreqTDDFDD,\ E-UTRAN}$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the largest value of the cell-specific positioning subframe configuration period, defined in TS 36.211 [16], among the measured n cells including the reference cell,

M is the number of PRS positioning occasions as defined in Table 8.1.2.6.2-1, where a PRS positioning occasion is as defined in clause 8.1.2.5.1,

 $\Delta = 160 \cdot \left\lceil \frac{n}{M} \right\rceil$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time and the processing time, and

the n cells are distributed on up to two carrier frequencies including a serving carrier frequency and one inter-frequency carrier.

Table 8.1.2.6.2-1: Number of PRS positioning occasions within $T_{RSTD\ InterFreqTDDFDD,\ E-UTRAN}$

Positioning subframe	Number of PRS positioning occasions M	
configuration period $T_{ m PRS}$	f2 Note1	f1 and f2 Note2
160 ms	16	32
>160 ms	8	16
NOTE 1: When inter-frequency RSTD measurements are performed over the reference cell and neighbour cells, which belong to the FDD inter-frequency carrier frequency f2.		
NOTE 2: When inter-frequency RSTD measurements are performed over the reference cell and the neighbour cells, which belong to the serving TDD carrier frequency f1 and the FDD inter-		

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{\text{RSTD InterFeqTDDFDD,E-UTRAN}}$, provided:

 $(PRS \hat{E}_s / Iot)_{raf} \ge -6 dB$ for all Frequency Bands for the reference cell,

frequency carrier frequency f2 respectively.

 $(PRS \hat{E}_s / Iot)_i \ge -13 \text{ dB for all Frequency Bands for neighbour cell } i$,

 $(PRS \hat{E}_s / Iot)_{ref}$ and $(PRS \hat{E}_s / Iot)_i$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning occasions,

PRP 1,2|dBm according to Annex B.2.6 for a corresponding Band,

PRS \hat{E}_s / Iot is as defined in Clause 8.1.2.5.1.

The time $T_{RSTD\,InterFeqTDDFDD,E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in TS 36.355 [24], are delivered to the physical layer of the UE.

If the inter-frequency handover occurs while inter-frequency RSTD measurements are being performed, and the inter-frequency carrier on which RSTD is measured becomes the new serving carrier frequency after the inter-frequency handover, the UE shall complete the ongoing OTDOA measurement session. The UE shall also meet the inter-frequency OTDOA measurement and accuracy requirements. However in this case the RSTD measurement period ($T_{RSTD\ InterFreqTDDFDD,\ E-UTRAN,\ HO}$) shall be according to the following expression:

$$T_{RSTD\ InterFreqTDDFDD,\ E-UTRAN,\ HO} = T_{RSTD\ InterFreqTDDFDD,\ E-UTRAN} + K \times T_{PRS} + T_{HO}$$
 ms

where:

K is the number of times the inter-frequency handover occurs during $T_{\text{RSTD InterFreqTDDFDD, E-UTRAN, HO}}$,

 $T_{\rm HO}$ is the time during which the inter-frequency RSTD measurement may not be possible due to inter-frequency handover; it can be up to 45 ms.

The RSTD measurement accuracy for all measured neighbor cells *i* shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.2.

Furthermore, due to the inter-frequency handover the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of those PCells on whose carriers RSTD measurement is performed during the RSTD measurement period.

The inter-frequency requirements in this clause (8.1.2.6.2) shall apply for all TDD special subframe configurations specified in TS 36.211 [16] and for the TDD uplink-downlink configurations as specified in Table 8.1.2.6.2-2.

Table 8.1.2.6.2-2: TDD uplink-downlink subframe configurations applicable for TDD-FDD interfrequency requirements

PRS Tr	ansmission Bandwidth [RB]	Applicable TDD uplink-downlink configurations
	6, 15	1, 2, 3, 4 and 5
	25, 50, 75, 100	0, 1, 2, 3, 4, 5 and 6
NOTE:	NOTE: Uplink-downlink configurations are specified in Table 4.2-2 in TS 36.211 [16].	

8.1.2.6.2.1 RSTD Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.6.3 E-UTRAN TDD-TDD Inter-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure inter-frequency RSTD, specified in TS 36.214 [4], for at least n=16 cells, including the reference cell, within $T_{RSTD InterFreqTDD, E-UTRAN}$ ms as given below:

$$T_{\text{RSTD InterFreqTDD, E-UTRAN}} = T_{\text{PRS}} \cdot (M - 1) + \Delta \qquad ms$$
 ,

where

 $T_{RSTD\ InterFreqTDD,\ E-UTRAN}$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the largest value of the cell-specific positioning subframe configuration period, defined in TS 36.211 [16], among the measured n cells including the reference cell,

M is the number of PRS positioning occasions as defined in Table 8.1.2.6.1-1, where a PRS positioning occasion is as defined in clause 8.1.2.5.1,

 $\Delta = 160 \cdot \left[\frac{n}{M} \right]$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time

and the processing time, and

the n cells are distributed on up to two carrier frequencies including a serving carrier frequency and one inter-frequency carrier.

Table 8.1.2.6.3-1: Number of PRS positioning occasions within $T_{RSTD\;InterFreqTDD,\;E-UTRAN}$

Positioning subframe	Number of PRS po	ositioning occasions $\it M$
configuration period $T_{ m PRS}$	f2 Note1	f1 and f2 Note2
160 ms	16	32
>160 ms	8	16

Note 1: When inter-frequency RSTD measurements are performed over the reference cell and neighbour cells, which belong to the TDD inter-frequency carrier frequency f2.

Note 2: When inter-frequency RSTD measurements are performed over the reference cell and the neighbour cells, which belong to the serving TDD carrier frequency f1 and the TDD inter-frequency carrier frequency f2 respectively.

The inter-frequency requirements in this clause (8.1.2.6.3) shall apply for all TDD special subframe configurations specified in TS 36.211 [16] and for the TDD uplink-downlink configurations as specified in Table 8.1.2.6.3-2.

Table 8.1.2.6.3-2: TDD uplink-downlink subframe configurations applicable for inter-frequency requirements

PRS T	ransmission Bandwidth [RB]	Applicable TDD uplink-downlink configurations
	6, 15	3, 4 and 5
	25	1, 2, 3, 4, 5 and 6
	50, 75, 100	0, 1, 2, 3, 4, 5 and 6
Note 1:	Uplink-downlink configurations a	re specified in Table 4.2-2 in TS 36.211 [16].
Note2:	Note2: For UEs capable of performing inter-frequency measurements without measurement gaps,	
	TDD uplink-downlink subframe configurations as specified in Table 8.1.2.5.2-2 shall apply.	

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{\text{RSTD InterFreqTDD, E-UTRAN}}$ provided:

 $(PRS \hat{E}_s / Iot)_{ref} \ge -6 \text{ dB for all Frequency Bands for the reference cell,}$

 $(PRS \hat{E}_s / Iot)_i \ge -13 \text{ dB for all Frequency Bands for neighbour cell } i$,

 $\left(\text{PRS } \hat{\mathbf{E}}_{\text{s}} / \text{Iot} \right)_{\text{ref}}$ and $\left(\text{PRS } \hat{\mathbf{E}}_{\text{s}} / \text{Iot} \right)_{i}$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning

PRP 1,2|dBm according to Annex B.2.6 for a corresponding Band

PRS \hat{E}_{a} / Iot is as defined in Clause 8.1.2.5.1.

The time $T_{RSTD\,InterFreqTDD,\,E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in TS 36.355 [24], are delivered to the physical layer of the UE.

If the inter-frequency handover occurs while inter-frequency RSTD measurements are being performed, and the inter-frequency carrier on which RSTD is measured becomes the new serving carrier frequency after the inter-frequency handover, the UE shall complete the ongoing OTDOA measurement session. The UE shall also meet the inter-frequency OTDOA measurement and accuracy requirements. However in this case the RSTD measurement period ($T_{RSTD\ InterFreqTDD,\ E-UTRAN,\ HO}$) shall be according to the following expression:

$$\mathbf{T}_{\text{RSTD InterFreqTDD, E-UTRAN, HO}} = \mathbf{T}_{\text{RSTD InterFreqTDD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{HO}} \qquad \textit{ms} \; ,$$

where:

K is the number of times the inter-frequency handover occurs during $T_{\text{RSTD InterFreqTDD, E-UTRAN, HO}}$,

 $T_{
m HO}$ is the time during which the inter-frequency RSTD measurement may not be possible due to inter-frequency handover; it can be up to 45 ms.

The RSTD measurement accuracy for all measured neighbor cells i shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.2.

Furthermore, due to the inter-frequency handover the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of those PCells on whose carriers RSTD measurement is performed during the RSTD measurement period.

8.1.2.6.3.1 RSTD Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.6.4 E-UTRAN FDD-TDD Inter-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure inter-frequency RSTD, specified in TS 36.214 [4], for at least n=16 cells, including the reference cell, within $T_{RSTD \, InterFeqFDDTDD,E-UTRAN}$ ms as given below:

$$T_{RSTD InterFeqFDDTDD,E-UTRAN} = T_{PRS} \cdot (M-1) + \Delta$$
 ms

where

 $T_{RSTD InterFeqFDDTDD,E-UTRAN}$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the largest value of the cell-specific positioning subframe configuration period, defined in TS 36.211 [16], among the measured n cells including the reference cell,

M is the number of PRS positioning occasions as defined in Table 8.1.2.6.4-1, where a PRS positioning occasion is as defined in clause 8.1.2.5.1,

 $\Delta = 160 \cdot \left[\frac{n}{M} \right]$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time

and the processing time, and

the n cells are distributed on up to two carrier frequencies including a serving carrier frequency and one inter-frequency carrier.

Table 8.1.2.6.4-1: Number of PRS positioning occasions within $T_{\text{RSTD InterFeqFDDTDD,E-UTRAN}}$

Positioning subframe Number of PRS positioning occasions $\it M$		tioning occasions $\it M$	
configu	uration period $T_{ m PRS}$	f2 Note1 f1 and f2 Note2	
	160 ms	16	32
	>160 ms	8	16
Note 1: When inter-frequency RSTD measurements are performed over the reference cell and neighbour cells, which belong to the TDD inter-frequency carrier frequency f2.			
Note 2: When inter-frequency RSTD measurements are performed over the reference cell and the neighbour cells, which belong to the serving FDD carrier frequency f1 and the TDD inter-frequency carrier frequency f2 respectively.			

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{\text{RSTD InterFeqFDDTDD,E-UTRAN}}$, provided:

 $(PRS \hat{E}_s / Iot)_{ref} \ge -6 dB$ for all Frequency Bands for the reference cell,

 $(PRS \hat{E}_s / Iot)_i \ge -13 \text{ dB for all Frequency Bands for neighbour cell } i$,

 $(PRS \hat{E}_s / Iot)_{ref}$ and $(PRS \hat{E}_s / Iot)_i$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning occasions,

PRP $1,2|_{dBm}$ according to Annex B.2.6 for a corresponding Band

PRS \hat{E}_s / Iot is as defined in Clause 8.1.2.5.1.

The time $T_{RSTD\ InterFeqFDDTDD,E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in TS 36.355 [24], are delivered to the physical layer of the UE.

If the inter-frequency handover occurs while inter-frequency RSTD measurements are being performed, and the inter-frequency carrier on which RSTD is measured becomes the new serving carrier frequency after the inter-frequency handover, the UE shall complete the ongoing OTDOA measurement session. The UE shall also meet the inter-frequency OTDOA measurement and accuracy requirements. However in this case the RSTD measurement period ($T_{RSTD\ InterFreqFDDTDD,\ E-UTRAN,\ HO}$) shall be according to the following expression:

$$\mathbf{T}_{\text{RSTD InterFreqFDDTDD, E-UTRAN, HO}} = \mathbf{T}_{\text{RSTD InterFreqFDDTDD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{HO}} \qquad \textit{ms} \; ,$$

where:

K is the number of times the inter-frequency handover occurs during $T_{\text{RSTD InterFreqFDDTDD, E-UTRAN, HO}}$,

 T_{HO} is the time during which the inter-frequency RSTD measurement may not be possible due to inter-frequency handover; it can be up to 45 ms.

The RSTD measurement accuracy for all measured neighbor cells *i* shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.2.

Furthermore, due to the inter-frequency handover the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of those PCells on whose carriers RSTD measurement is performed during the RSTD measurement period.

The inter-frequency requirements in this clause (8.1.2.6.4) shall apply for all TDD special subframe configurations specified in TS 36.211 [16] and for the TDD uplink-downlink configurations as specified in Table 8.1.2.6.4-2.

Table 8.1.2.6.4-2: TDD uplink-downlink subframe configurations applicable for inter-frequency requirements

PRS T	ransmission Bandwidth [RB]	Applicable TDD uplink-downlink configurations
	6, 15	3, 4 and 5
	25	1, 2, 3, 4, 5 and 6
50, 75, 100 0, 1, 2, 3, 4, 5 and 6		0, 1, 2, 3, 4, 5 and 6
Note 1:	ote 1: Uplink-downlink configurations are specified in Table 4.2-2 in TS 36.211 [16].	
Note2:	Note2: For UEs capable of performing inter-frequency measurements without measurement gaps,	
	TDD uplink-downlink subframe configurations as specified in Table 8.1.2.5.2-2 shall apply.	

8.1.2.6.4.1 RSTD Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.7 E-UTRAN E-CID Measurements

8.1.2.7.1 E-UTRAN FDD UE Rx-Tx Time Difference Measurements

When no DRX is used the physical layer measurement period of the UE Rx-Tx time difference measurement shall be 200 ms.

When DRX is used in RRC_CONNECTED state the physical layer measurement period ($T_{measure_FDD_UE_Rx_Tx1}$) of the UE Rx-Tx time difference measurement shall be as specified in table 8.1.2.7.1-1. When eDRX_CONN is used in RRC_CONNECTED state, the physical layer measurement period ($T_{measure_FDD_UE_Rx_Tx1}$) of the UE Rx-Tx time difference measurement shall be as specified in table 8.1.2.7.1-2.

Table 8.1.2.7.1-1: FDD UE Rx-Tx time difference measurement requirement when DRX is used

DRX cycle length (s)	T _{measure_FDD_UE_Rx_Tx1} (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04 <drx-cycle≤2.56< td=""><td>Note2 (5)</td></drx-cycle≤2.56<>	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use	
Note2: Time depends upon the DRX cycle in use	

Table 8.1.2.7.1-2: FDD UE Rx-Tx time difference measurement requirement when eDRX_CONN is

eDRX_CONN cycle length (s)	T _{measure_FDD_UE_Rx_Tx1} (s) (eDRX_CONN cvcles)
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note (5)</td></edrx_conn>	Note (5)
Note: Time depends upon the eDRX_CONN cycle in use	

If the UE is performing UE Rx-Tx time difference measurement while the PCell is changed due to the handover then the UE shall restart the Rx-Tx measurement on the new cell. In this case the UE shall also meet the UE Rx-Tx time difference measurement and accuracy requirements. However the physical layer measurement period of the UE Rx-Tx measurement shall not exceed $T_{measure_FDD_UE_Rx_Tx3}$ as defined in the following expression:

$$T_{\text{measure FDD UE Rx Tx3}} = (K+1)*(T_{\text{measure FDD UE Rx Tx1}}) + K*T_{\text{PCcell change handover}}$$

Where:

K is the number of times the PCell is changed over the measurement period (T_{measure FDD UE Rx Tx3}),

 $T_{PCell_change_handover}$ is the time necessary to change the PCell due to handover; it can be up to 45 ms.

If the UE supporting E-UTRA carrier aggregation when configured with the secondary component carrier(s) is performing UE Rx-Tx time difference measurement while the PCell is changed regardless whether the primary component carrier is changed or not then the UE shall restart the Rx-Tx measurement on the new PCell. In this case the UE shall also meet the UE Rx-Tx time difference measurement and accuracy requirements corresponding to the new PCell. However the physical layer measurement period of the UE Rx-Tx measurement shall not exceed $T_{measure\ FDD\ UE\ Rx\ Tx2}$ as defined in the following expression:

$$T_{measure_FDD_UE_Rx_Tx2} = (N+1)*(T_{measure_FDD_UE_Rx_Tx1}) + N*T_{PCell_change_CA}$$

Where:

N is the number of times the PCell is changed over the measurement period (T_{measure FDD UE Rx Tx2}),

 $T_{PCell_change_CA}$ is the time necessary to change the PCell; it can be up to 25 ms.

If IDC autonomous denial is configured then the UE shall also meet the requirements, provided not more than 30 IDC autonomous denial suframes are configured over an IDC autonomous denial validity period of at least 200 ms.

The measurement accuracy for the UE Rx-Tx time difference measurement when DRX or eDRX_CONN is used as well as when no DRX is used shall be as specified in the sub-clause 9.1.9.

8.1.2.7.1.1 UE Rx-Tx Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other RRC or LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in subclause 9.1.9.

8.1.2.7.2 E-UTRAN TDD UE Rx-Tx Time Difference Measurements

When no DRX is used the physical layer measurement period of the UE Rx-Tx time difference measurement shall be 200 ms.

When DRX is used in RRC_CONNECTED state the physical layer measurement period ($T_{measure_TDD_UE_Rx_Tx1}$) of the UE Rx-Tx time difference measurement shall be as specified in table 8.1.2.7.2-1. When eDRX_CONN is used in RRC_CONNECTED state the physical layer measurement period ($T_{measure_TDD_UE_Rx_Tx1}$) of the UE Rx-Tx time difference measurement shall be as specified in table 8.1.2.7.2-2.

Table 8.1.2.7.2-1: TDD UE Rx-Tx time difference measurement requirement when DRX is used

DRX cycle length (s)	T _{measure_TDD_UE_Rx_Tx1} (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04 <drx-cycle≤2.56< td=""><td>Note2 (5)</td></drx-cycle≤2.56<>	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use	
Note2: Time depends upon the DRX cycle in use	

Table 8.1.2.7.2-2: TDD UE Rx-Tx time difference measurement requirement when eDRX_CONN is used

eDRX_CONN cycle length (s)	T _{measure_TDD_UE_Rx_Tx1} (s) (eDRX_CONN cycles)
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note (5)</td></edrx_conn>	Note (5)
Note: Time depends upon the eDRX_CONN cycle in use	

If the UE is performing UE Rx-Tx time difference measurement while the PCell is changed due to the handover then the UE shall restart the Rx-Tx measurement on the new cell. In this case the UE shall also meet the UE Rx-Tx time difference measurement and accuracy requirements. However the physical layer measurement period of the UE Rx-Tx measurement shall not exceed $T_{measure\ TDD\ UE\ Rx\ Tx3}$ as defined in the following expression:

$$T_{measure\ TDD\ UE\ Rx\ Tx3} = (K+1)*(T_{measure\ TDD\ UE\ Rx\ Tx1}) + K*T_{PCell\ change\ handover}$$

Where:

K is the number of times the PCell is changed over the measurement period (T_{measure TDD UE Rx Tx3}),

T_{PCell change handover} is the time necessary to change the PCell due to handover; it can be up to 45 ms.

If the UE supporting E-UTRA carrier aggregation when configured with the secondary component carrier(s) is performing UE Rx-Tx time difference measurement while the PCell is changed regardless whether the primary component carrier is changed or not then the UE shall restart the Rx-Tx measurement on the new PCell. In this case the UE shall also meet the UE Rx-Tx time difference measurement and accuracy requirements corresponding to the new PCell. However the physical layer measurement period of the UE Rx-Tx measurement shall not exceed $T_{measure\ TDD\ UE\ Rx\ Tx2}$ as defined in the following expression:

Where:

N is the number of times the PCell is changed over the measurement period (T_{measure TDD UE Rx Tx2}),

T_{PCell_change_CA} is the time necessary to change the PCell; it can be up to 25 ms.

If IDC autonomous denial is configured then the UE shall also meet the requirements, provided not more than 30 IDC autonomous denial suframes are configured over an IDC autonomous denial validity period of at least 200 ms.

The measurement accuracy for the UE Rx-Tx time difference measurement when DRX or eDRX_CONN is used as well as when no DRX is used shall be as specified in the sub-clause 9.1.9.

For UE, which does not support simultaneous reception and transmission for inter-band TDD CA specified in TS 36.331 [2], and is compliant to the requirements for inter-band CA with uplink in one E-UTRA band and without simultaneous Rx/Tx specified in TS 36.101 [5], the UE Rx-Tx time difference measurement requirements in Section 8.1.2.7.2 shall apply also with different TDD UL/DL subframe configurations and/or different special subframe configurations used in CCs of different bands, under the following additional conditions:

- UE is not simultaneously scheduled in UL and DL on the different CCs, and
- At least one downlink and one uplink subframes per radio frame are available for the UE Rx-Tx time difference measurement in the measured cell.

8.1.2.7.2.1 UE Rx-Tx Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other RRC or LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in subclause 9.1.9.

8.1.2.7.3 E-UTRAN FDD Intra-frequency E-CID RSRP and RSRQ Measurements

8.1.2.7.3.1 Introduction

The requirements in section 8.1.2.7.3 shall apply provided the UE has received ECID-RequestLocationInformation message from E-SMLC via LPP requesting the UE to report E-CID E-UTRAN FDD intra-frequency RSRP and RSRQ measurements [24].

8.1.2.7.3.2 Measurement Requirements

The requirements in section 8.1.2.2.1 and section 8.1.2.8.1 also apply for this section except the measurement reporting requirements. The measurement reporting requirements for E-CID RSRP and RSRQ are defined in section 8.1.2.7.3.3.

8.1.2.7.3.3 Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.1.2 and 9.1.5 respectively.

8.1.2.7.4 E-UTRAN TDD Intra-frequency E-CID RSRP and RSRQ Measurements

8.1.2.7.4.1 Introduction

The requirements in section 8.1.2.7.4 shall apply provided the UE has received ECID-RequestLocationInformation message from E-SMLC via LPP requesting the UE to report E-CID E-UTRAN TDD intra-frequency RSRP and RSRQ measurements [24].

8.1.2.7.4.2 Measurement Requirements

The requirements in section 8.1.2.2.2 and section 8.1.2.8.2 also apply for this section except the measurement reporting requirements. The measurement reporting requirements for E-CID RSRP and RSRQ are defined in section 8.1.2.7.4.3.

8.1.2.7.4.3 Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.1.2 and 9.1.5 respectively.

8.1.2.8 E-UTRAN intra-frequency measurements under time domain measurement resource restriction

The requirements in sections 8.1.2.8.1 and 8.1.2.8.2 shall apply for cells for which time domain measurement resource restriction patterns for performing E-UTRAN FDD intra-frequency measurements and E-UTRAN TDD intra-frequency measurements, respectively, are configured by higher layers (TS 36.331 [2]), provided that also the following additional conditions are fulfilled:

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the intra-frequency measurements, and

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

For cells which are not configured for measurements in the subframes indicated by the time-domain measurement resource restriction pattern, the corresponding requirements specified in Clause 8.1.2.2 apply.

8.1.2.8.1 E-UTRAN FDD intra-frequency measurements

8.1.2.8.1.1 E-UTRAN intra-frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within

$$T_{\text{identify_intra_eICIC}} = T_{\text{basic_identify_E-UTRA_FDD_eICIC, intra}} \cdot \frac{T_{\text{Measurement_Period_eICIC, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

where

 $T_{basic_identify_E-UTRA_FDD_eICIC,\ intra}$ is 1000 ms.

 T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.2.3 and 9.1.2.4 and RSRQ related side conditions given in Clause 9.1.5.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_eICIC, Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement_intra_eICIC}}$ cells , where $Y_{\text{measurement_intra_eICIC}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement_intra_eICIC}}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement_intra_eICIC}} = Floor \left\{ X_{\text{basic_measurement_FDD_eICIC}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period_eICIC, Intra}}} \right\} \text{ cells}$$

where

 $X_{basic_measurement_FDD_eICIC} = 8$ (cells)

 $T_{Measurement_Period_eICIC,\;Intra}$ = 200 ms is the measurement period for intra-frequency RSRP and RSRQ measurements.

The RSRP and RSRQ measurement accuracy for the measured cells configured with a time-domain measurement resource restriction pattern for RRM intra-frequency measurements shall be as specified in the sub-clauses 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

8.1.2.8.1.1.1 Measurement Reporting Requirements

8.1.2.8.1.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

8.1.2.8.1.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.8.1.1.1.3.

8.1.2.8.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_eICIC}$ defined in Clause 8.1.2.8.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_eICIC}$ defined in clause 8.1.2.8.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_eICIC, Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.8.1.2 E-UTRAN intra-frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra_elCIC}$ as shown in table 8.1.2.8.1.2-1.

Table 8.1.2.8.1.2-1: Requirement to identify a newly detectable FDD intra-frequency cell

DRX cycle length (s)		T _{identify_intra_elClC} (s) (DRX cycles)
≤0.0≥	4	1 (Note1)
0.04 <d< td=""><td>RX-</td><td>Note2 (52)</td></d<>	RX-	Note2 (52)
cycle≤0.08		
0.128		4.22 (33)
0.128 <drx-< td=""><td>Note2 (28)</td></drx-<>		Note2 (28)
cycle≤2.56		
Note1:	Num	ber of DRX cycle
	depends upon the DRX	
	cycle in use	
Note2:	Note2: Time depends upon the	
DRX		cycle in use

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.2.3 and 9.1.2.4 and RSRQ related side conditions given in Clause 9.1.5.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.8 for a corresponding Band.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure_intra_eICIC}$ as shown in table 8.1.2.8.1.2-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_eICIC}$.

Table 8.1.2.8.1.2-2: Requirement to measure FDD intra-frequency cells

DRX cycle length (s)		T _{measure_intra_elClC} (s) (DRX cycles)
≤0.04	1	0.2 (Note1)
0.04 <d< td=""><td>RX-</td><td>Note2 (7)</td></d<>	RX-	Note2 (7)
cycle≤0.16		
0.16 <drx-< td=""><td>Note2 (5)</td></drx-<>		Note2 (5)
cycle≤2.56		
Note1: Number of DRX		ber of DRX cycle
depends upon the DRX		ends upon the DRX
cycle ii		e in use
Note2:		e depends upon the cycle in use
	עאט	Cycle III use

The RSRP and RSRQ measurement accuracy for the measured cells configured with a time-domain measurement resource restriction pattern for RRM intra-frequency measurements shall be as specified in the sub-clauses 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

8.1.2.8.1.2.1 Measurement Reporting Requirements

8.1.2.8.1.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

8.1.2.8.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.8.1.2.1.3.

8.1.2.8.1.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra_eICIC}$ defined in Clause 8.1.2.8.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_elCIC}$ defined in clause 8.1.2.8.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_elCIC}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.8.2 E-UTRAN TDD intra-frequency measurements

8.1.2.8.2.1 E-UTRAN intra-frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable TDD intra-frequency cell within

$$T_{\text{identify_intra_eICIC}} = T_{\text{basic_identify_E-UTRA_TDD_eICIC, intra}} \cdot \frac{T_{\text{Measurement_Period_eICIC, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

where

 $T_{basic_identify_E\text{-}UTRA_TDD_eICIC,\,intra}$ is 1000 ms.

 T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.2.3 and 9.1.2.4 and RSRQ related side conditions given in Clause 9.1.5.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_eICIC, Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells , including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement_intra_eICIC}}$ cells , where $Y_{\text{measurement_intra_eICIC}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement_intra_eICIC}}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement_intra_eICIC}} = Floor \left\{ X_{\text{basic_measurement_TDD_eICIC}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period_eICIC, Intra}}} \right\} \text{ cells}$$

where

 $X_{basic_measurement_TDD_eICIC} = 8 \text{ (cells)}$

 $T_{Measurement_Period_eICIC,\ Intra} = 200\ ms$ is the measurement period for intra-frequency RSRP and RSRQ measurements.

The RSRP and RSRQ measurement accuracy for the measured cells configured with a time-domain measurement resource restriction pattern for RRM intra-frequency measurements shall be as specified in the sub-clauses 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

8.1.2.8.2.1.1 Measurement Reporting Requirements

8.1.2.8.2.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

8.1.2.8.2.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.8.2.1.1.3.

8.1.2.8.2.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra_elCIC}$ defined in Clause 8.1.2.8.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_eICIC}$ defined in clause 8.1.2.8.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_eICIC, Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.8.2.2 E-UTRAN intra-frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra_elCIC}$ as shown in table 8.1.2.8.2.2-1.

Table 8.1.2.8.2.2-1: Requirement to identify a newly detectable TDD intra-frequency cell

DRX cycle length (s)		T _{identify_intra_elCIC} (s) (DRX cycles)	
≤0.0≥	4	1 (Note1)	
0.04 <d< td=""><td>RX-</td><td>Note2 (52)</td></d<>	RX-	Note2 (52)	
cycle≤0.08			
0.128		4.22 (33)	
0.128 <drx-< td=""><td>Note2 (28)</td></drx-<>		Note2 (28)	
cycle≤2.56			
Note1:	Note1: Number of DRX cycle		
	depends upon the DRX		
	cycle in use		
Note2:	Time depends upon the		
DRX cycle in use			

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.2.3 and 9.1.2.4 and RSRQ related side conditions given in Clause 9.1.5.2 are fulfilled for a corresponding Band,
- SCH RP and SCH Ês/Iot according to Annex B.2.8 for a corresponding Band.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_eICIC}$ as shown in table 8.1.2.8.2.2-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain

measurement resource restriction pattern, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_eICIC}$.

Table 8.1.2.8.2.2-2: Requirement to measure TDD intra-frequency cells

DRX cycle length (s)		T _{measure_intra_elCIC} (s) (DRX cycles)
≤0.0≥	1	0.2 (Note1)
0.04 <drx-< td=""><td>Note2 (7)</td></drx-<>		Note2 (7)
cycle≤0.16		
0.16 <drx-< td=""><td>Note2 (5)</td></drx-<>		Note2 (5)
cycle≤2.56		
Note1:		ber of DRX cycle
depends upon the DRX		ends upon the DRX
cycle in use.		e in use.
Note2: Time		depends upon the
DRX		cycle in use.

The RSRP and RSRQ measurement accuracy for the measured cells configured with a time-domain measurement resource restriction pattern for RRM intra-frequency measurements shall be as specified in the sub-clauses 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

8.1.2.8.2.2.1 Measurement Reporting Requirements

8.1.2.8.2.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

8.1.2.8.2.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.8.2.2.1.3.

8.1.2.8.2.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.3, 9.1.2.4, and 9.1.5.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra_eICIC}$ defined in Clause 8.1.2.8.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_elCIC}$ defined in clause 8.1.2.8.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_elCIC}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.8.3 E-UTRAN FDD intra-frequency measurements with CRS assistance information

The requirements in clause 8.1.2.8.3 shall apply for the UEs supporting the PSS/SSS and common channel interference handling, and CRS interference handling features. Moreover, the core requirements shall be satisfied provided that the following additional conditions are fulfilled:

- The UE is provided with the CRS assistance information via higher layers (TS 36.331 [2]),
- The CRS assistance information is valid during the entire measurement period.

The requirements in this section shall also be met when the number of transmit antenna ports [16] of one or more cells whose CRS assistance information is provided [2] is different from the number of transmit antenna ports of the measured cell.

8.1.2.8.3.1 E-UTRAN intra-frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within:

$$T_{\text{identify_intra_FeICIC}} = T_{\text{basic_identify_E-UTRA_FDD_FeICIC, intra}} \cdot \frac{T_{\text{Measurement_Period_FeICIC, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

where

Tbasic identify E-UTRA FDD FeICIC, intra is 1000 ms.

 T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when:

- RSRP related side conditions given in Sections 9.1.2.5 and 9.1.2.6 and RSRQ related side conditions given in Section 9.1.5.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B, clause B.2.9 for a corresponding Band (Notes 1, 2).

Note 1: Part of the Iot includes the interference from at least:

- the PCell, or
- PCell and one intra-frequency neighbouring cell indicated in the CRS assistance information, or
- One or two intra-frequency neighbouring cells indicated in the CRS assistance information.

CRS assistance information has been provided for the intra-frequency neighbouring cells that generate interference. UE may use the CRS assistance information to mitigate the interference.

Note 2: An intra-frequency cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_FeICIC,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern and the cells indicated in the CRS assistance information, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least

 $Y_{measurement_intra_FeICIC}$ cells , where $Y_{measurement_intra_FeICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement_intra}$ FeICIC cells, the UE shall perform measurements of at least 8 identified intra-

frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement_intra_FeICIC}} = Floor \left\{ X_{\text{basic_measurement_FDD_FeICIC}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period_FeICIC, Intra}}} \right\} \text{ cells}$$

where

 $X_{basic_measurement_FDD_FeICIC} = 8$ (cells).

 $T_{Measurement_Period_FeICIC,\ Intra} = 200\ ms$ is the measurement period for intra-frequency RSRP and RSRQ measurements.

The RSRP and RSRQ measurement accuracy for the measured cells configured with a time-domain measurement resource restriction pattern for RRM intra-frequency measurements with CRS assistance information shall be as specified in the sub-clauses 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

8.1.2.8.3.1.1 Measurement Reporting Requirements

8.1.2.8.3.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

8.1.2.8.3.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.8.3.1.1.3.

8.1.2.8.3.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T_{identify_intra_FeICIC} defined in Clause 8.1.2.8.3.1. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_FeICIC}$ defined in clause 8.1.2.8.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_FeICIC,\ Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.8.3.2 E-UTRAN intra-frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra_FeICIC}$ as shown in table 8.1.2.8.3.2-1.

Table 8.1.2.8.3.2-1: Requirement to identify a newly detectable FDD intra-frequency cell

DRX cycle length (s)	T _{identify_intra_FelCIC} (s) (DRX cycles)
≤0.04	1 (Note 1)
0.04 <drx-cycle≤0.08< td=""><td>Note 2 (52)</td></drx-cycle≤0.08<>	Note 2 (52)
0.128	4.22 (33)
0.128 <drx-cycle≤2.56< td=""><td>Note 2 (28]</td></drx-cycle≤2.56<>	Note 2 (28]
NOTE 1: Number of DRX cycle	depends upon the DRX cycle in use.

NOTE 1: Number of DRX cycle depends upon the DRX cycle in use.

NOTE 2: Time depends upon the DRX cycle in use.

A cell shall be considered detectable when:

- RSRP related side conditions given in Sections 9.1.2.5 and 9.1.2.6 and RSRQ related side conditions given in Section 9.1.5.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B, clause B.2.9 for a corresponding Band (Notes 1, 2).

Note 1: Part of the Iot includes the interference from at least:

- the PCell, or
- PCell and one intra-frequency neighbouring cell indicated in the CRS assistance information, or
- One or two intra-frequency neighbouring cells indicated in the CRS assistance information.

CRS assistance information has been provided for the intra-frequency neighbouring cells that generate interference. UE may use the CRS assistance information to mitigate the interference.

Note 2: An intra-frequency cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure_intra_FeICIC}$ as shown in table 8.1.2.8.3.2-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern and the cell indicated in CRS assistance information, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_FeICIC}$.

Table 8.1.2.8.3.2-2: Requirement to measure FDD intra-frequency cells

DRX cycle length (s)	T _{identify_intra_FelCiC} (s) (DRX cycles)
≤0.04	0.2 (Note 1)
0.04 <drx-cycle≤0.16< td=""><td>Note 2 (7)</td></drx-cycle≤0.16<>	Note 2 (7)
0.16 <drx-cycle≤2.56< td=""><td>Note 2 (5)</td></drx-cycle≤2.56<>	Note 2 (5)
NOTE 1: Number of DRX cycle	depends upon the DRX cycle in use.
NOTE 2: Time depends upon the	ne DRX cycle in use.

The RSRP and RSRQ measurement accuracy for the measured cells configured with a time-domain measurement resource restriction pattern for RRM intra-frequency measurements shall be as specified in the sub-clauses 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

8.1.2.8.3.2.1 Measurement Reporting Requirements

8.1.2.8.3.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

8.1.2.8.3.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.8.3.2.1.3.

8.1.2.8.3.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T_{identify_intra_FeICIC} defined in clause 8.1.2.8.3.2. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_FeICIC}$ defined in clause 8.1.2.8.3.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_FeICIC}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.8.4 E-UTRAN TDD intra-frequency measurements with CRS assistance infromation

The requirements in clause 8.1.2.8.3 shall apply for the UEs upporting the PSS/SSS and common channel interference handling, and CRS interference handling features. Moreover, the core requirements shall be satisfied provided that the following additional conditions are fulfilled:

- The UE is provided with the CRS assistance information via higher layers (TS 36.331 [2]),
- The CRS assistance information is valid during the entire measurement period.

The requirements in this section shall also be met when the number of transmit antenna ports [16] of one or more cells whose CRS assistance information is provided [2] is different from the number of transmit antenna ports of the measured cell.

8.1.2.8.4.1 E-UTRAN intra-frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable TDD intra-frequency cell within

$$T_{\text{identify_intra_FeICIC}} = T_{\text{basic_identify_E-UTRA_TDD_FeICIC, intra}} \cdot \frac{T_{\text{Measurement_Period_FeICIC, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

where

Tbasic identify E-UTRA TDD eICIC, intra is 1000 ms.

 T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when:

- RSRP related side conditions given in Sections 9.1.2.5 and 9.1.2.6 and RSRQ related side conditions given in Section 9.1.5.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.9 for a corresponding Band (Notes 1, 2).

Note 1: Part of the Iot includes the interference from at least:

- the PCell, or
- PCell and one intra-frequency neighbouring cell indicated in the CRS assistance information, or
- One or two intra-frequency neighbouring cells indicated in the CRS assistance information

CRS assistance information has been provided for the intra-frequency neighbouring cells that generate interference. UE may use the CRS assistance information to mitigate the interference.

Note 2: An intra-frequency cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_FeICIC,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern and the cells indicated in the CRS assistance information, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least

 $Y_{measurement_intra_FeICIC}$ cells , where $Y_{measurement_intra_FeICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement_intra_FeICIC}$ cells, the UE shall perform measurements of at least 8 identified intrafrequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement_intra_FeICIC}} = Floor \left\{ X_{\text{basic_measurement_TDD_FeICIC}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period_FeICIC, Intra}} \right\} \text{ cells}$$

where

X_{basic} measurement TDD FeICIC = 8 (cells)

 $T_{Measurement_Period_FeICIC,\ Intra} = 200 ms$ is the measurement period for intra-frequency RSRP and RSRQ measurements.

The RSRP and RSRQ measurement accuracy for the measured cells configured with a time-domain measurement resource restriction pattern for RRM intra-frequency measurements with CRS assistance information shall be as specified in the sub-clauses 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

8.1.2.8.4.1.1 Measurement Reporting Requirements

8.1.2.8.4.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

8.1.2.8.4.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.8.4.1.1.3.

8.1.2.8.4.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T_{identify_intra_FeICIC} defined in clause 8.1.2.8.4.1. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_FeICIC}$ defined in clause 8.1.2.8.4.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_FeICIC_,Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.8.4.2 E-UTRAN intra-frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra_FeICIC}$ as shown in table 8.1.2.8.4.2-1.

Table 8.1.2.8.4.2-1: Requirement to identify a newly detectable TDD intra-frequency cell

DRX cycle length (s)	T _{identify_intra_FelCiC} (s) (DRX cycles)	
≤0.04	1 (Note 1)	
0.04 <drx-cycle≤0.08< td=""><td>Note 2 (52)</td></drx-cycle≤0.08<>	Note 2 (52)	
0.128	4.22 (33)	
0.128 <drx-cycle≤2.56< td=""><td>Note 2 (28)</td></drx-cycle≤2.56<>	Note 2 (28)	
NOTE 1: Number of DRX cycle depends upon the DRX cycle in use.		
NOTE 2: Time depends upon tl	he DRX cycle in use.	

A cell shall be considered detectable when:

- RSRP related side conditions given in Sections 9.1.2.5 and 9.1.2.6 and RSRQ related side conditions given in Section 9.1.5.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.9 for a corresponding Band (Notes 1, 2).

Note 1: Part of the Iot includes the interference from at least:

- the PCell, or
- PCell and one intra-frequency neighbouring cell indicated in the CRS assistance information, or
- One or two intra-frequency neighbouring cells indicated in the CRS assistance information.

CRS assistance information has been provided for the intra-frequency neighbouring cells that generate interference. UE may use the CRS assistance information to mitigate the interference.

Note 2: An intra-frequency cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_FeICIC}$ as shown in table 8.1.2.8.4.2-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified

intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern and the cell indicated in CRS assistance information, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_FeICIC}$.

Table 8.1.2.8.4.2-2: Requirement to measure TDD intra-frequency cells

DRX cycle length (s)	T _{identify_intra_FelCIC} (s) (DRX cycles)
≤0.04	0.2 (Note 1)
0.04 <drx-cycle≤0.16< td=""><td>Note 2 (7)</td></drx-cycle≤0.16<>	Note 2 (7)
0.16 <drx-cycle≤2.56< td=""><td>Note 2 (5)</td></drx-cycle≤2.56<>	Note 2 (5)
NOTE 1: Number of DRX cycle NOTE 2: Time depends upon	e depends upon the DRX cycle in use. the DRX cycle in use.

The RSRP and RSRQ measurement accuracy for the measured cells configured with a time-domain measurement resource restriction pattern for RRM intra-frequency measurements shall be as specified in the sub-clauses 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

8.1.2.8.4.2.1 Measurement Reporting Requirements

8.1.2.8.4.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

8.1.2.8.4.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.8.2.2.1.3.

8.1.2.8.4.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.2.5, 9.1.2.6, and 9.1.5.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T identify_intra_FeICIC defined in clause 8.1.2.8.4.2. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_FeICIC}$ defined in clause 8.1.2.8.4.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_FeICIC}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.1.2.9 E-UTRAN E-CID Measurements when Time Domain Measurement Resource Restriction Pattern is Configured

8.1.2.9.1 E-UTRAN FDD UE Rx-Tx Time Difference Measurements

The requirements in this clause apply for UE configured with a time-domain measurement resource restriction pattern for PCell measurements, provided that also the following additional conditions are fulfilled:

- The time domain measurement resource restriction pattern configured for the PCell (TS 36.331 [2]) indicates at least one subframe per radio frame for performing the PCell measurements, and
- Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

When the UE is provided with a time-domain measurement resource restriction pattern for PCell measurements, the UE Rx-Tx time difference measurement shall meet the measurement requirements specified in Clause 8.1.2.7.1 and accuracy requirements specified in Clause 9.1.9.3, where the condition $\hat{E}s/Iot \ge -3dB$ in Table 9.1.9.3-1 corresponds to the CRS $\hat{E}s/Iot$ in subframes indicated by the time-domain measurement resource restriction pattern for PCell measurements (TS 36.331 [2]).

NOTE: It is up to the UE implementation whether the UE Rx-Tx time difference measurement is performed in any subframe or in subframes indicated by the time-domain measurement resource restriction pattern.

8.1.2.9.2 E-UTRAN TDD UE Rx-Tx Time Difference Measurements

The requirements in this clause apply for UE configured with a time-domain measurement resource restriction pattern for PCell measurements, provided that also the following additional conditions are fulfilled:

- The time domain measurement resource restriction pattern configured for the PCell (TS 36.331 [2]) indicates at least one subframe per radio frame for performing the PCell measurements, and
- Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

When the UE is provided with a time-domain measurement resource restriction pattern for PCell measurements, the UE Rx-Tx time difference measurement shall meet the measurement requirements specified in Clause 8.1.2.7.2 and accuracy requirements specified in Clause 9.1.9.3, where the condition $\hat{E}s/Iot \ge -3dB$ in Table 9.1.9.3-1 corresponds to the CRS $\hat{E}s/Iot$ in subframes indicated by the time-domain measurement resource restriction pattern for PCell measurements (TS 36.331 [2]).

NOTE: It is up to the UE implementation whether the UE Rx-Tx time difference measurement is performed in any subframe or in subframes indicated by the time-domain measurement resource restriction pattern.

8.1.2.9.3 E-UTRAN FDD UE Rx-Tx Time Difference Measurements with CRS Assistance Information

For UE configured with a time-domain measurement resource restriction pattern for PCell measurements, the requirements in this section apply under the following conditions:

- The time domain measurement resource restriction pattern configured for the PCell (TS 36.331 [2]) indicates at least one subframe per radio frame for performing the PCell measurements, and
- Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern, and
- The UE is provided with the CRS assistance information (TS 36.331 [2]) and the CRS assistance information is valid throughout the entire evaluation period.

When the UE is provided with a time-domain measurement resource restriction pattern for serving cell measurements, the UE Rx-Tx time difference measurement shall meet the measurement requirements specified in Section 8.1.2.7.1 and accuracy requirements specified in Section 9.1.9.4.

The requirements in this section shall also be met when the number of transmit antenna ports [16] of one or more cells whose CRS assistance information is provided [2] is different from the number of transmit antenna ports of the measured cell.

NOTE: It is up to the UE implementation whether the UE Rx-Tx time difference measurement is performed in any subframe or in subframes indicated by the time-domain measurement resource restriction pattern.

8.1.2.9.4 E-UTRAN TDD UE Rx-Tx Time Difference Measurements with CRS Assistance Information

For UE configured with a time-domain measurement resource restriction pattern for PCell measurements, the requirements in this section apply under the following conditions:

- The time domain measurement resource restriction pattern configured for the PCell (TS 36.331 [2]) indicates at least one subframe per radio frame for performing the PCell measurements, and
- Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern, and
- The UE is provided with the CRS assistance information (TS 36.331 [2]) and the CRS assistance information is valid throughout the entire evaluation period.

When the UE is provided with a time-domain measurement resource restriction pattern for serving cell measurements, the UE Rx-Tx time difference measurement shall meet the measurement requirements specified in Section 8.1.2.7.2 and accuracy requirements specified in Section 9.1.9.4.

The requirements in this section shall also be met when the number of transmit antenna ports [16] of one or more cells whose CRS assistance information is provided [2] is different from the number of transmit antenna ports of the measured cell.

NOTE: It is up to the UE implementation whether the UE Rx-Tx time difference measurement is performed in any subframe or in subframes indicated by the time-domain measurement resource restriction pattern.

8.2 Capabilities for Support of Event Triggering and Reporting Criteria

8.2.1 Introduction

This clause contains requirements on UE capabilities for support of event triggering and reporting criteria. As long as the measurement configuration does not exceed the requirements stated in clause 8.2.2, the UE shall meet the performance requirements defined in clause 9.

The UE can be requested to make measurements under different measurement identities defined in TS 36.331 [2]. Each measurement identity corresponds to either event based reporting, periodic reporting, logged measurement reporting [2] or no reporting. In case of event based reporting, each measurement identity is associated with an event. In case of periodic reporting, a measurement identity is associated with one periodic reporting criterion. In case of logged measurement reporting, a measurement identity is associated with one logged measurement reporting criterion. In case of no reporting, a measurement identity is associated with one no reporting criterion.

The purpose of this clause is to set some limits on the number of different event, periodic, logged measurement and no reporting criteria the UE may be requested to track in parallel.

8.2.2 Requirements

In this clause a reporting criterion corresponds to either one event (in the case of event based reporting), or one periodic reporting criterion (in case of periodic reporting), or one logged measurement reporting criterion (in case of logged measurement reporting), or one no reporting criterion (in case of no reporting). For event based reporting, each instance of event, with the same or different event identities, is counted as separate reporting criterion in table 8.2.2-1.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to table 8.2.2-1. For the measurement categories belonging to measurements on: E-UTRA intra-frequency cells, E-UTRA inter-frequency cells,

and inter-RAT per supported RAT(i.e. without counting other categories that the UE shall always support in parallel), the UE need not support more than the total number of reporting criteria as follows:

- 26 reporting criteria in total if the UE is not configured with any SCell or PSCell carrier frequency,
- 35 reporting criteria in total if the UE is configured with one SCell carrier frequency,
- 44 reporting criteria in total if the UE is configured with two SCell carrier frequencies,
- 53 reporting criteria in total if the UE is configured with three SCell carrier frequencies,
- 62 reporting criteria in total if the UE is configured with four SCell carrier frequencies,
- 35 reporting criteria in total if the UE is configured with one PSCell carrier frequency, and
- 44 reporting criteria in total if the UE is configured with one PSCell carrier frequency and one SCell carrier frequency.

Editor's note: the total reporting criteria above are to be updated if all UEs will have to support RS-SINR measurements.

A UE supporting increased number of carriers to monitor beyond 3 carriers shall be able to support up to 20 reporting criteria for inter-frequency measurement category according to table 8.2.2-1. Additionally such UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to table 8.2.2-1. For the measurement categories belonging to measurements on: E-UTRA intra-frequency cells, E-UTRA inter-frequency cells, and inter-RAT per supported RAT, the UE need not support more than the total number of reporting criteria as follows:

- 39 reporting criteria in total if the UE is not configured with any SCell carrier frequency,
- 48 reporting criteria in total if the UE is configured with one SCell carrier frequency,
- 57 reporting criteria in total if the UE is configured with two SCell carrier frequencies,
- 48 reporting criteria in total if the UE is configured with one PSCell carrier frequency,
- 57 reporting criteria in total if the UE is configured with one PSCell carrier frequency and one SCell carrier frequencies,
- 66 reporting criteria in total if the UE is configured with three SCell carrier frequencies, and
- 75 reporting criteria in total if the UE is configured with four SCell carrier frequencies.

Editor's note: the total reporting criteria above are to be updated if all UEs will have to support RS-SINR measurements.

Table 8.2.2-1: Requirements for reporting criteria per measurement category

Measurement category	E _{cat}	Note	
Intra-frequency Note 1	10	Events for any one or a combination of intra- frequency RSRP, RSRQ, and RS-SINR ^{Note4} for E-UTRA intra-frequency cells	
Intra-frequency UE Rx-Tx time difference	2	Intra-frequency UE Rx-Tx time difference measurements reported to E-UTRAN via RRC and to positioning server via LPP. Applies for UE supporting both LPP and UE Rx-Tx time difference measurement.	
Intra-frequency RSTD Note 2	1	Intra-frequency RSTD measurement reporting for UE supporting OTDOA; 1 report capable of minimum 16 cell measurements for the intra-frequency	
Intra-frequency RSRP and RSRQ measure for E-CID	rements 1	Intra-frequency RSRP and RSRQ measurements for E-CID reported to E-SMLC via LPP [24]. One report capable of at least in total 9 intra-frequency RSRP and RSRQ measurements. Applicable to UE capable of reporting RSRP and RSRQ to E-SMLC via LPP.	
Inter-frequency	10 / 28	Events for any one or a combination of inter- frequency RSRP, RSRQ, and RS-SINR ^{Note4} for E-UTRA inter-frequency cells (see note 3)	
Inter-frequency RSTD Note 2	1	Inter-frequency RSTD measurement reporting for UE supporting OTDOA; 1 report capable of minimum 16 cell measurements for at least one inter-frequency. Only applicable as specified in Section 8.1.2.6.	
Inter-RAT (GSM, cdma2000 1 x RTT and	HRPD) 5	Only applicable for UE with this (inter-RAT) capability. This requirement (E _{cat} = 5) is per supported RAT.	
Inter-RAT (UTRAN FDD, UTRAN TDD)	5 or 11	Only applicable for UE with this (inter-RAT) capability. This requirement (E _{cat} = 5 or 11) is per supported RAT. For UE which indicate support for Increased UE carrier monitoring UTRA E _{cat} = 11.	
MBSFN measurements for MDT	1	MBSFN measurement reporting for UE supporting MBSFN measurements (MBSFN RSRP, MBSFN RSRQ, and MCH BLER) for MDT [2]; 1 report capable of minimum 1 MBSFN RSRP measurement [4], 1 MBSFN RSRQ measurement [4], and 1 MCH BLER measurement [4].	
applied per serving frequency. Note 2: When the UE is configured with least 2 reporting criteria for all F frequency, SCell carrier frequencies, the UE sha measurements configured to be	n one SCell carrier frequences RSTD measurements concy and inter-frequency of the capable of supporting performed on PCell car	carrier frequency, E _{cat} for Intra-frequency is ency, the UE shall be capable of supporting at nfigured to be performed on PCell carrier carrier. When the UE is configured with two SCelling at least 3 reporting criteria for all RSTD rrier frequency, the two SCell carrier frequencies when there is a single on-going LPP OTDOA	
number of carriers to monitor be Note 4: For UEs supporting RS-SINR m	Support of Ecat of 28 for Measurement category Inter-frequency is applied for a UE supporting increased number of carriers to monitor beyond 3. For UEs supporting RS-SINR measurements (Editor's note: the note is to be removed if the RS-SINR measurement support is mandatory).		

8.3 Measurements for E-UTRA carrier aggregation

8.3.1 Introduction

Requirements in this clause are applicable to UE supporting E-UTRA FDD, E-UTRA TDD and/or E-UTRA TDD-FDD carrier aggregation.

Non configured frequencies may be measured with measurement gaps or autonomous gaps according to the requirements in clause 8.1.2.3 (E-UTRAN inter frequency measurements and E-UTRAN inter frequency measurements with autonomous gaps).

For UE, which does not support simultaneous reception and transmission for inter-band TDD CA specified in TS 36.331, and is compliant to the requirements for inter-band CA with uplink in one E-UTRA band and without simultaneous Rx/Tx specified in TS 36.101, the inter-band CA requirements in Section 8.3 shall apply also with different TDD UL/DL subframe configurations and/or different special subframe configurations used in CCs of different bands, under the following additional conditions:

- UE is not simultaneously scheduled in UL and DL on the different CCs, and
- at least DL subframe #0 or DL subframe #5 are available for measurements in the measured cell.

8.3.2 Measurements of the primary component carrier

Measurements of cells on the primary component carrier shall meet all applicable requirements (FDD or TDD) in clause 8.1.2.2 (E-UTRAN intra frequency measurements and E-UTRAN intra frequency measurements with autonomous gaps)

8.3.3 Measurements of a secondary component carrier

A Secondary component carrier may be activated and deactivated by MAC-CE commands as specified in [17]. The applicable performance requirements depend on whether the SCell on the corresponding frequency is actived or deactivated.

8.3.3.1 Measurements of a secondary component carrier with active SCell

When the SCell is activated, measurement performance requirements for the frequency are those given in clause 8.1.2.2(E-UTRAN intra frequency measurements and E-UTRAN intra frequency measurements with autonomous gaps). If common DRX is in use, then the requirements for that secondary component carrier are given by the applicable DRX requirements (FDD or TDD) in clause 8.1.2.2, otherwise the non DRX requirements are applicable. The applicable measurement accuracy requirements are in clause 9.1.11 (Carrier aggregation measurement accuracy)

8.3.3.2 Measurements of a secondary component carrier with deactivated SCell

This clause defines the measurement requirements of a secondary component carrier with deactivated SCell based on the parameter *measCycleSCell* defined in TS 36.331 [2].

8.3.3.2.1 E-UTRAN secondary component carrier measurements when no common DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\ scc}$, according to the parameter measCycleSCell where $T_{identify\ scc} = 20\ measCycleSCell$

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure_scc}$ according to the parameter measCycleSCell where $T_{measure_scc} = 5$ measCycleSCell. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_scc}$.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on up to four SCCs with deactivated SCell. This may cause interruptions on PCell or activated SCell(s) or both that are specified in Section 7.8.

8.3.3.2.1.1 Measurement Reporting Requirements

8.3.3.2.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in clause 9.

8.3.3.2.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.3.2.1.1.3.

8.3.3.2.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_scc}$ defined in Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_scc}$ defined in clause 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_scc}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.3.3.2.2 E-UTRAN secondary component carrier measurements when common DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify_scc}$, according to the parameter measCycleSCell where $T_{identify_scc} = max(20 \ measCycleSCell)$, $T_{identify_scc1}$ is given in table 8.3.3.2.2-1.

Table 8.3.3.2.2-1: Requirement for Tidentify scc1

DRX cycle length (s)	T _{identify_scc1} (s) (DRX cycles)
≤0.04	0.8 (Note1)
0.04 <drx-< td=""><td>Note2 (40)</td></drx-<>	Note2 (40)
cycle≤0.08	
0.128	3.2 (25)
0.128 <drx-< td=""><td>Note2(20)</td></drx-<>	Note2(20)
cycle≤2.56	
1	

Note1: Number of DRX cycle depends upon the DRX cycle in use

Note2: Time depends upon the DRX cycle in use

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure_scc}$ according to the parameter measCycleSCell where $T_{measure_scc} = max(5 measCycleSCell, T_{measure_scc})$. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_scc}$. $T_{measure_scc1}$ is given in table 8.3.3.2.2-2

Table 8.3.3.2.2-2: Requirement for T_{measure_scc1}

DRX cycle length (s)	T _{measure_scc1} (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04 <drx-< td=""><td>Note2 (5)</td></drx-<>	Note2 (5)
cycle≤2.56	

Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure receiver bandwidth taking into account the SCell activation/deactivation status, and when making measurements of cells on up to four SCCs with deactivated SCell. This may cause interruptions (packet drops) to a PCell or activated SCell(s) or both when the PCell and the SCell belong to the same frequency band. No interruptions while the On Duration timer is running shall be allowed when common DRX is used. The requirement considers only interruptions due to reconfiguration of the receiver bandwidth, and not due to other causes such as RF impairments or channel conditions.

8.3.3.2.2.1 Measurement Reporting Requirements

8.3.3.2.2.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in clause 9.

8.3.3.2.2.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.3.2.2.1.3.

8.3.3.2.2.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_scc}$ defined in Clause 8.3.3.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_scc}$ defined in clause 8.3.3.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_scc}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.4 OTDOA RSTD Measurements for E-UTRAN carrier aggregation

8.4.1 Introduction

This clause contains RSTD measurement requirements on UE capabilities for support of E-UTRA carrier aggregation. Requirements in this clause are applicable to all carrier aggregation capable UE which have been configured with one or two downlink Scell(s). Non-configured frequencies may be measured with measurement gaps according to the requirements in clause 8.1.2.6, i.e., E-UTRAN inter-frequency RSTD measurement period applies. Requirements in this clause are applicable for E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD carrier aggregation.

For UE, which does not support simultaneous reception and transmission for inter-band TDD CA specified in TS 36.331 [2], and is compliant to the requirements for inter-band CA with uplink in one E-UTRA band and without simultaneous Rx/Tx specified in TS 36.101 [5], RSTD requirements in Section 8.4 shall apply also with different TDD UL/DL subframe configurations and/or different special subframe configurations used in CCs of different bands, under the following additional conditions:

all positioning subframes indicated in the OTDOA assistance data and specified in Section 9.1.10 are available for RSTD measurements in the measured and reference cells; and

- UE is not simultaneously scheduled in UL and DL on the different CCs.

8.4.2 Measurements on the primary component carrier

The RSTD measurements on cells belonging to the primary component carrier shall meet all applicable requirements (FDD or TDD) specified in clause 8.1.2.5, i.e., E-UTRAN intra-frequency RSTD measurement period applies.

The RSTD measurement accuracy for all the measurements on the primary component carrier shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.12.

If the PCell is changed, regardless whether the primary component carrier is changed or not while the RSTD measurements are being performed on cells belonging to the primary component carrier, then the UE shall complete the ongoing OTDOA measurement session. In case of change of the primary component carrier, the requirements shall apply only if the primary component carrier is swapped with any of the currently configured secondary component carrier(s). The UE shall also meet the OTDOA measurement and accuracy requirements for the primary component carrier. However in this case the total RSTD measurement period ($T_{RSTD, E-UTRAN, PCell_change}$) shall be according to the following expression:

$$T_{RSTD, E-UTRAN, PCell \ change} = T_{RSTD, E-UTRAN} + K \times T_{PRS} + T_{PCell \ change}$$
 ms,

where:

K is the number of times the PCell is changed during $T_{\text{RSTD, E-UTRAN, PCell_change}}$,

 $T_{\rm PRS}$ is defined in clause 8.1.2.5,

 $T_{\text{PCell_change}}$ is the time during which the RSTD measurement may not be possible due to PCell change; it can be up to 25 ms,

 $T_{RSTD,\,E-UTRAN}$ corresponds to the E-UTRAN intra-frequency RSTD measurement period as specified in clause 8.1.2.5.

Furthermore, due to the PCell changing the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of those PCell/SCell(s) on whose carriers RSTD measurement is performed during the RSTD measurement period.

8.4.3 Measurements on a secondary component carrier

The RSTD measurements when all cells are on a configured secondary component carrier shall meet all applicable requirements (FDD or TDD) specified in clause 8.1.2.5, i.e., E-UTRAN intra-frequency RSTD measurement period applies, regardless of whether the Scell on the corresponding frequency is activated or deactivated by the MAC-CE commands as specified in [17].

The RSTD measurement accuracy for all the measurements on the secondary component carrier shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.12.

A UE may reconfigure receiver bandwidth taking into account the SCell activation/deactivation status, and when making RSTD measurements on cells belonging to SCC with deactivated SCell. This may cause interruptions (packet drops) to a PCell when the PCell and the SCell belong to the adjacent or non-adjacent component carriers in the same frequency band or to different frequency bands. In this case, the UE shall follow the interruption requirements specified in Section 7.10. No interruption to the PCell shall be allowed during the PRS positioning occasion on the PCell.

If the PCell is changed, regardless whether the primary component carrier is changed or not while the RSTD measurements are being performed on cells belonging to the secondary component carrier, then the UE shall complete the ongoing OTDOA measurement session. In case of change of the primary component carrier, the requirements shall apply only if the primary component carrier is swapped with any of the currently configured secondary component carrier(s). The UE shall also meet the OTDOA measurement and accuracy requirements for the secondary component carrier. However in this case the total RSTD measurement period ($T_{RSTD,\,E-UTRAN,\,PCell_change}$) shall be according to the following expression:

$$T_{RSTD, E-UTRAN, PCell \ change} = T_{RSTD, E-UTRAN} + K \times T_{PRS} + T_{PCell \ change}$$
 ms,

where:

K is the number of times the PCell is changed during $T_{\text{RSTD, E-UTRAN, PCell_change}}$,

 $T_{\rm PRS}$ is defined in clause 8.1.2.5,

 $T_{\text{PCell_change}}$ is the time during which the RSTD measurement may not be possible due to PCell change; it can be up to 25 ms,

 $T_{RSTD,\,E-UTRAN}$ corresponds to the E-UTRAN intra-frequency RSTD measurement period as specified in clause 8.1.2.5.

Furthermore, due to the PCell changing the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of those PCell/SCell(s) on whose carriers RSTD measurement is performed during the RSTD measurement period.

8.4.4 Measurements on both primary component carrier and a secondary component carrier

The RSTD measurements of cells on both primary component carrier and a configured secondary component carrier shall meet all applicable requirements (FDD-FDD, TDD-TDD, TDD-FDD or FDD-TDD inter-Frequency OTDOA) specified in clause 8.1.2.6, i.e., E-UTRAN inter-frequency RSTD measurement period applies regardless of whether the SCell on the corresponding frequency is activated or deactivated by the MAC-CE commands as specified in [17], with the following exceptions

- the number of PRS positioning occasions is as specified in Table 8.4.4-1 shall apply, and
- TDD uplink-downlink subframes configurations as specified in Clause 8.1.2.5.2, Table 8.1.2.5.2-2 shall apply.

Table 8.4.4-1: Number of PRS positioning occasions within measurement period

Positioning subframe configuration period $T_{ m PRS}$	Number of PRS positioning occasions M
160 ms	32
>160 ms	16

The RSTD measurement accuracy for all the measurements on both primary component carrier and the secondary component carrier shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.12.

A UE may reconfigure its receiver bandwidth taking into account the SCell activation/deactivation status, and when performing RSTD measurements on cells belonging to at least SCC with deactivated SCell. This may cause interruptions (packet drops) on a PCell when the PCell and the SCell belong to the adjacent or non-adjacent component carriers in the same frequency band or to different frequency bands. In this case, the UE shall follow the interruption requirements specified in Section 7.10. No interruption to the PCell shall be allowed during the PRS positioning occasion on the PCell.

If the PCell is changed regardless whether the primary component carrier is changed or not while the RSTD measurements are being performed on cells belonging to both the primary component carrier and the secondary component carrier then the UE shall complete the ongoing OTDOA measurement session. In case of change of the primary component carrier, the requirements shall apply only if the primary component carrier is swapped with any of the currently configured secondary component carrier(s). The UE shall also meet the OTDOA measurement and accuracy requirements for the primary and secondary component carrier. However in this case the total RSTD measurement period ($T_{RSTD, E-UTRAN, PCell_change}$) shall be according to the following expression:

$$T_{\text{RSTD, E-UTRAN, PCell change}} = T_{\text{RSTD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{PCell change}}$$
 ms,

where:

K is the number of times the PCell is changed during $T_{\text{RSTD, E-UTRAN, PCell_change}}$,

 $T_{\rm PRS}$ is defined in clause 8.1.2.6,

 $T_{\text{PCell_change}}$ is the time during which the RSTD measurement may not be possible due to PCell change; it can be up to 25 ms.

 $T_{RSTD,\,E-UTRAN}$ corresponds to the E-UTRAN inter-frequency RSTD measurement period as specified in clause 8.1.2.6 with the exception that the number of PRS positioning occasions is as specified in Table 8.4.4-1.

Furthermore, due to the PCell changing the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of those PCell/SCell(s) on whose carriers RSTD measurement is performed during the RSTD measurement period.

8.4.5 Measurements on different secondary component carriers

The RSTD measurements of cells on a configured secondary component carrier and another configured secondary component carrier shall meet all applicable requirements (FDD-FDD, TDD-TDD, TDD-FDD or FDD-TDD inter-Frequency OTDOA) specified in clause 8.1.2.6, i.e., E-UTRAN inter-frequency RSTD measurement period applies regardless of whether the SCell on the corresponding frequency is activated or deactivated by the MAC-CE commands as specified in [17], with the following exceptions

- the number of PRS positioning occasions is as specified in Table 8.4.4-1 shall apply, and
- TDD uplink-downlink subframes configurations as specified in Clause 8.1.2.5.2, Table 8.1.2.5.2-2 shall apply.

Table 8.4.4-1: Number of PRS positioning occasions within measurement period

Positioning subframe configuration period $T_{ m PRS}$	Number of PRS positioning occasions M
160 ms	32
>160 ms	16

The RSTD measurement accuracy for all the measurements on the secondary component carriers shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.12.

A UE may reconfigure its receiver bandwidth taking into account the SCell activation/deactivation status, and when performing RSTD measurements on cells belonging to at least SCC with deactivated SCell. This may cause interruptions (packet drops) on a PCell when the PCell and the SCell belong to the adjacent or non-adjacent component carriers in the same frequency band or to different frequency bands. In this case, the UE shall follow the interruption requirements specified in Section 7.10. No interruption to the PCell shall be allowed during the PRS positioning occasion on the PCell.

If the PCell is changed regardless whether the primary component carrier is changed or not while the RSTD measurements are being performed on cells belonging to the secondary component carriers then the UE shall complete the ongoing OTDOA measurement session. In case of change of the primary component carrier, the requirements shall apply only if the primary component carrier is swapped with any of the currently configured secondary component carrier(s). The UE shall also meet the OTDOA measurement and accuracy requirements for the secondary component carriers. However in this case the total RSTD measurement period ($T_{RSTD,\,E-UTRAN,\,PCell_change}$) shall be according to the following expression:

$$T_{RSTD, E-UTRAN, PCell \ change} = T_{RSTD, E-UTRAN} + K \times T_{PRS} + T_{PCell \ change}$$
 ms,

where:

K is the number of times the PCell is changed during $T_{\text{RSTD, E-UTRAN, PCell_change}}$,

 $T_{\rm PRS}$ is defined in clause 8.1.2.6,

 $T_{\text{PCell_change}}$ is the time during which the RSTD measurement may not be possible due to PCell change; it can be up to 25 ms.

 $T_{RSTD,\,E-UTRAN}$ corresponds to the E-UTRAN inter-frequency RSTD measurement period as specified in clause 8.1.2.6 with the exception that the number of PRS positioning occasions is as specified in Table 8.4.4-1.

Furthermore, due to the PCell changing the UE shall meet the RSTD measurement accuracy for a PRS bandwidth which is not larger than the minimum channel bandwidth of those PCell/SCell(s) on whose carriers RSTD measurement is performed during the RSTD measurement period.

8.5 Measurements for UE category 0

8.5.1 Introduction

The UE category 0 applicability of the requirements in subclause 8.5 is defined in Section 3.6.1.

This clause contains requirements on the UE regarding measurement reporting in RRC_CONNECTED state. The requirements are specified for E-UTRA intra frequency measurements. These measurements may be used by the E-UTRAN, e.g. for handover decisions. The measurement quantities are defined in [4], the measurement model is defined in [22] and measurement accuracies are specified in clause 9. Control of measurement reporting is specified in TS 36.331 [2].

When the UE is provided with IDC solution, the UE shall also perform RRM measurements and meet the corresponding requirements in clause 8.

8.5.2 Requirements

8.5.2.1 E-UTRAN intra frequency measurements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

8.5.2.1.1 E-UTRAN FDD intra frequency measurements

8.5.2.1.1.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{\text{identify intra_UE cat 0}} = T_{\text{basic_identify_E-UTRA_FDD_UE cat 0}} \cdot \frac{T_{\text{Measurement_Period_UE cat 0, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

where

T_{basic identify E-UTRA FDD UE cat 0, intra} is 1000 ms

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in Clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band.

 T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_UE\ cat\ 0\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRPand RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement intra_UE cat 0}}$ cells , where $Y_{\text{measurement intra_UE cat 0}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra_UE cat 0}}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement_intra_UE cat 0}} = Floor \left\{ X_{\text{basic_measurement_FDD_UE cat 0}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period_UE cat 0, Intra}} \right\}$$

cells where

 $X_{\text{basic measurement FDD UE cat 0}} = 8 \text{ (cells)}$

 $T_{Measurement_Period_UE\ cat\ 0,\ Intra} = 400~ms.$ The measurement period for Intra frequency RSRP and RSRQ measurements

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.13.3.

8.5.2.1.1.1.1 Measurement Reporting Requirements

8.5.2.1.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

8.5.2.1.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.5.2.1.1.1.1.3.

8.5.2.1.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify\ intra_UE\ cat\ 0}$ defined in Clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ 0}$ defined in clause 8.5.2.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_UE\ cat\ 0,\ Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.5.2.1.1.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra_UE\ cat\ 0}$ as shown in table 8.5.2.1.1.2-1. When eDRX_CONN is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within $T_{identify_intra_UE\ cat\ 0}$ as shown in table 8.5.2.1.1.2-1A.

Table 8.5.2.1.1.2-1: Requirement to identify a newly detectable FDD intrafrequency cell

DRX cycle length (s)	T _{identify_intra_UE cat 0} (s) (DRX cycles)
≤0.04	[1] (Note1)
0.04 <drx-< td=""><td>Note2 (40)</td></drx-<>	Note2 (40)
cycle≤0.08	
0.128	3.2 (25)
0.128 <drx-< td=""><td>Note2(20)</td></drx-<>	Note2(20)
cycle≤2.56	
Neted Noveless of DDV souls	

Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use

Table 8.5.2.1.1.2-1A: Requirement to identify a newly detectable FDD intra-frequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{identify_intra_UE cat 0} (s) (eDRX_CONN cycles)	
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note(20)</td></edrx_conn>	Note(20)	
Note: Time depends upon the eDRX_CONN cycle in use		

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in Clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_UE\ cat\ 0}$. When DRX is used, $T_{measure_intra_UE\ cat\ 0}$ is as defined in table 8.5.2.1.1.2-2, when eDRX_CONN is used, $T_{measure_intra_UE\ cat\ 0}$ is as defined in table 8.5.2.1.1.2-3. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra\ UE\ cat\ 0}$.

Table 8.5.2.1.1.2-2: Requirement to measure FDD intrafrequency cells

DRX cycle length (s)	T _{measure_intra_UE cat 0} (s) (DRX cycles)	
≤0.08	0.4 (Note1)	
0.08 <drx-< td=""><td>Note2 (5)</td></drx-<>	Note2 (5)	
cycle≤2.56		
Note1: Number of DRX cycle		
depends upon the DRX cycle in use		
Note2: Time depends upon the DRX		
cycle in use		

Table 8.5.2.1.1.2-3: Requirement to measure FDD intra-frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{measure_intra_UE cat 0} (s) (eDRX_CONN cycles)	
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note (5)</td></edrx_conn>	Note (5)	
Note: Time depends upon the eDRX_CONN cycle in use		

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.13.3.

8.5.2.1.1.2.1 Measurement Reporting Requirements

8.5.2.1.1.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

8.5.2.1.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.5.2.1.1.2.1.3.

8.5.2.1.1.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra,\ UE\ cat\ 0}$ defined in Clause 8.5.2.1.1.2 When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ 0}$ defined in clause 8.5.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_UE\ cat\ 0}$ provided the timing to that cell has not changed more than $\pm\ 50$ Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.5.2.1.2 E-UTRAN intra frequency measurements for HD-FDD

8.5.2.1.2.1 E-UTRAN intra frequency measurements when no DRX is used

The requirements in this section are applicable for the UE which supports half duplex operation on one or more supported frequency bands [2].

The requirements defined in clause 8.5.2.1.1.1 also apply for this section provided the following conditions are met:

- at least downlink subframe # 0 or downlink subframe # 5 per radio frame of an intra-frequency cell to be identified by the UE is available at the UE over $T_{identify_intra_UE\ cat\ 0}$;
- at least one downlink subframe per radio frame of measured cell is available at the UE for RSRP and RSRQ measurements assuming measured cell is identified cell over T_{measure_intra_UE cat 0}.

8.5.2.1.2.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra_UE\ cat\ 0}$ as shown in table 8.5.2.1.2.2-1. When eDRX_CONN is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within $T_{identify\ intra\ UE\ cat\ 0}$ as shown in table 8.5.2.1.2.2-1A.

Table 8.5.2.1.2.2-1: Requirement to identify a newly detectable HD-FDD intrafrequency cell

DRX cycle length (s)	T _{identify_intra_UE cat 0} (s) (DRX cycles)
≤0.04	1 (Note1)
0.04 <drx-< td=""><td>Note2 (50)</td></drx-<>	Note2 (50)
cycle≤0.08	
0.128	3.2 (32)
0.128 <drx-< td=""><td>Note2(25)</td></drx-<>	Note2(25)
cycle≤2.56	
Note1: Number of DRX cycle	

depends upon the DRX cycle in use
Note2: Time depends upon the DRX
cycle in use

Table 8.5.2.1.2.2-1A: Requirement to identify a newly detectable HD-FDD intra-frequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{identify_intra_UE cat 0} (s) (eDRX_CONN cycles)
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note (25)</td></edrx_conn>	Note (25)
Note: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in Clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band

When DRX is in use, in the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_UE\ cat\ 0}$ as shown in table 8.5.2.1.2.2-2. When eDRX_CONN is in use in the RRC_CONNECTED state, the measurement period for intra-frequency measurements is $T_{measure_intra_UE\ cat\ 0}$ as shown in table 8.5.2.1.2.2-3. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_UE\ cat\ 0}$.

Table 8.5.2.1.2.2-2: Requirement to measure HD-FDD intrafrequency cells

DRX cycle length (s)	T _{measure_intra_UE cat 0} (s) (DRX cycles)
≤0.04	0.4 (Note1)
0.04 <drx-< td=""><td>Note2 (7)</td></drx-<>	Note2 (7)
cycle≤0.16	
0.16 <drx- cycle≤2.56</drx- 	Note2(5)

Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use

Table 8.5.2.1.2.2-3: Requirement to measure HD-FDD intra-frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T _{measure_intra_UE cat 0} (s) (eDRX_CONN cycles)
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note (5)</td></edrx_conn>	Note (5)
Note: Time depends upon the eDRX_CONN cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.13.3.

8.5.2.1.1.2.1 Measurement Reporting Requirements

8.5.2.1.1.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

8.5.2.1.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.5.2.1.1.2.1.3.

8.5.2.1.1.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra_UE\ cat\ 0}$ defined in Clause 8.5.2.1.1.2 When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ 0}$ defined in clause 8.5.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_UE\ cat\ 0}$ provided the timing to that cell has not changed more than $\pm\ 50$ Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.5.2.1.3 E-UTRAN TDD intra frequency measurements

8.5.2.1.3.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within

$$T_{\text{identify intra_UE cat 0}} = T_{\text{basic identify }\textit{E-UTRA_TDD_UE cat 0, intra}} \cdot \frac{T_{\text{Measurement Period_UE cat 0, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

where

T_{basic identify E-UTRA TDD UE cat 0, intra} is 1000 ms

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in Clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band

 T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_UE\ cat\ 0\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement intra_UE cat 0}}$ cells , where $Y_{\text{measurement intra_UE cat 0}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra_UE cat 0}}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement intra_UE cat 0}} = Floor \left\{ X_{\text{basic measurement TDD_UE cat 0}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period_UE cat 0, Intra}} \right\}$$

cells where

 $X_{basic\ measurement\ TDD_UE\ cat\ 0} =\ 8\ (cells)$

 $T_{\text{Measurement_Period intra_UE cat 0}} = 400 \text{ ms.}$ The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.13.3.

8.5.2.1.3.1.1 Measurement Reporting Requirements

8.5.2.1.3.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

8.5.2.1.3.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.5.2.1.3.1.1.3.

8.5.2.1.3.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify\;intra_UE\;cat\;0}$ defined in Clause 8.5.2.1.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ 0}$ defined in clause 8.5.2.1.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ Intra_UE\ cat\ 0}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.5.2.1.3.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra_UE\ cat\ 0}$ as shown in table 8.5.2.1.3.2-1. When eDRX_CONN is in use the UE shall be able to identify a new detectable TDD intra-frequency cell within $T_{identify_intra_UE\ cat\ 0}$ as defined in table 8.5.2.1.3.2-1A.

Table 8.5.2.1.3.2-1: Requirement to identify a newly detectable TDD intrafrequency cell

DRX cycle length (s)	T _{identify_intra_UE cat 0} (s) (DRX cycles)	
≤0.04	1 (Note1)	
0.04 <drx-< td=""><td>Note2 (40)</td></drx-<>	Note2 (40)	
cycle≤0.08		
0.128	3.2 (25)	
0.128 <drx-< td=""><td>Note2(20)</td></drx-<>	Note2(20)	
cycle≤2.56		
Note1: Number of DRX cycle		
depends upon the DRX cycle in use		
N C T		

Note2: Time depends upon the DRX cycle in use

Table 8.5.2.1.3.2-1A: Requirement to identify a newly detectable TDD intra-frequency cell when eDRX CONN cycle is used

eDRX_CONN cycle length (s)	T _{identify_intra_UE cat 0} (s) (eDRX_CONN cycles)
2.56 <edrx_conn cycle≤10.24<="" td=""><td>Note (20)</td></edrx_conn>	Note (20)
Note: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in Clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band

When DRX is in use in the RRC_CONNECTED state the measurement period for intra frequency measurements is T_{measure intra UE cat 0} as shown in table 8.5.2.1.3.2-2. When eDRX_CONN in the RRC_CONNECTED state is in use, the measurement period for intra-frequency measurements is $T_{measure_intra_UE\ cat\ 0}$ as defined in table 8.5.2.1.3.2-3. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_UE\ cat\ 0}$.

Table 8.5.2.1.3.2-2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	T _{measure_intra_UE cat 0} (s) (DRX cycles)	
≤0.08	0.4 (Note1)	
0.08 <drx-< td=""><td>Note2 (5)</td></drx-<>	Note2 (5)	
cycle≤2.56		
Note1: Number of DRX cycle		
depends upon the		
DRX cycle in use.		
Note2: Time depends upon the DRX cycle in use.		

Table 8.5.2.1.3.2-3: Requirement to measure TDD intra-frequency cells when eDRX_CONN cycle is

eDR	X_CONN cycle length (s)	T _{measure_intra_UE cat 0} (s) (eDRX_CONN cycles)
2.56	<edrx_conn cycle≤10.24<="" td=""><td>Note (5)</td></edrx_conn>	Note (5)
Note: Time depends upon the eDRX_CONN cycle in use.		

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.13.3.

8.5.2.1.3.2.1 Measurement Reporting Requirements

8.5.2.1.3.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

8.5.2.1.3.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.5.2.1.3.2.1.3.

8.5.2.1.3.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times \text{TTI}_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra_UE\ cat\ 0}$ defined in Clause 8.5.2.1.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ 0}$ defined in clause 8.5.2.1.3.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_UE\ cat\ 0}$ provided the timing to that cell has not changed more than $\pm\ 50$ Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.5.2.1.4 E-UTRAN FDD intra frequency measurements with autonomous gaps for UE category 0

The requirements defined in this subclause 8.5.2.1.4 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.

8.5.2.1.4.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify CGI LC-UE, intra}} = T_{\text{basic identify CGI LC-UE, intra}}$$
 ms

Where

 $T_{basic_identify_CGI_LC-UE, intra} = 190$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI_LC-UE,intra}$ is applicable when no DRX is used as well as when any of the DRX or eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{\text{identify_CGI_LC-UE, intra}}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX and no eDRX CONN cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

8.5.2.1.4.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.5.2.1.5 E-UTRAN intra frequency measurements with autonomous gaps for HD-FDD UE category 0

The requirements in this section are applicable for the UE which supports half duplex FDD operation on one or more supported frequency bands [2].

The requirements defined in this subclause 8.5.2.1.5 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.

8.5.2.1.5.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

All the CGI requirements with the exception of requirement on the number of ACK/NACK transmission on PCell defined in clause 8.5.2.1.4.1 also apply for this section.

For the UE supporting half duplex FDD operation there is no requirement in terms of number of ACK/NACK transmission on PCell.

8.5.2.1.5.2 ECGI Reporting Delay

The ECGI reporting delay defined in clause 8.5.2.1.4.2 also apply for this section.

8.5.2.1.6 E-UTRAN TDD intra frequency measurements with autonomous gaps for UE category 0

The requirements defined in this subclause 8.5.2.1.6 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.

8.5.2.1.6.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify_CGI_LC-UE, intra}} = T_{\text{basic_identify_CGI_LC-UE, intra}}$$
 ms

Where

 $T_{basic_identify_CGI_LC-UE, intra} = 190$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI_LC-UE, intra}$ is applicable when no DRX is used as well as when any of the DRX or eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{\text{identify_CGI_LC-UE, intra}}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.5.2.1.6.1-1 on PCell provided that:

- there is continuous DL data allocation.
- no DRX and no eDRX_CONN cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.5.2.1.6.1-1: Requirement on minimum number of ACK/NACKs to transmit during T_{basic_identify_CGI_LC-UE, intra}.

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0	30
1	54
2	68
3	56
4	61
5	66
6	46

8.5.2.1.6.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.6 Discovery signal measurements

8.6.1 Introduction

This clause contains requirements on the UE for measurement reporting in RRC_CONNECTED state when discovery signal [16] is configured. The requirements are specified for E-UTRA CRS based discovery signal measurements and CSI-RS based discovery signal measurements. These measurements may be used by the E-UTRAN, e.g. for handover decisions. The measurement quantities are defined in [4], the measurement model is defined in [22] and measurement accuracy requirements are specified in clause 9. Control of measurement reporting is specified in TS 36.331 [2].

The requirements in Section 9 are applicable for a UE performing measurements according to Section 8.6.

8.6.2 Requirements for CRS based discovery signal measurements

8.6.2.1 E-UTRAN intra frequency measurements

The UE shall be able to identify new intra-frequency cells and perform measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

8.6.2.1.1 E-UTRAN FDD intra frequency measurements

8.6.2.1.1.1 E-UTRAN FDD intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra_SCE}$,

 $T_{identify_intra_SCE} = 12* T_{DMTC_periodicity} + T_{Measurement_Period_intra_FDD_CRS}$

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.14.2 and RSRQ related side conditions given in Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

T_{DMTC} periodicity is the discovery signal measurement timing configuration periodicity of higher layer.

T_{Measurement Period intra FDD CRS} is the intra-frequency period for measurements as shown in table 8.6.2.1.1.1-1

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period\ intra_FDD_CRS}$ when no DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement_Period}$ _intra_FDD_CRS as shown in table 8.6.2.1.1.1-1, when no DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement_Period_intra_FDD_CRS}$

Table 8.6.2.1.1.1-1: Requirement to measure FDD intra frequency cell

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period intra_FDD_CRS} [ms]
≥6	≥1	5 * T _{DMTC_periodicity}
≥25	≥1	3 * T _{DMTC periodicity}

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.14.4.

8.6.2.1.1.1.1 Measurement Reporting Requirements

8.6.2.1.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

8.6.2.1.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.2.1.1.1.1.3.

8.6.2.1.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_SCE}$ defined in Clause 8.6.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_SCE}$ defined in clause 8.6.2.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_intra_FDD_CRS}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.2.1.1.2 E-UTRAN FDD intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\ intra\ SCE\ DRX}$.

Tidentify intra SCE DRX = 16* Max { TDMTC periodicity, DRX cycle length} + TMeasurement Period intra FDD CRS DRX

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.14.2 and RSRQ related side conditions given in Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH RP and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

 $T_{DMTC_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

 $T_{Measurement_Period_intra_FDD_CRS_DRX} \ is \ the \ intra-frequency \ period \ for \ measurements \ as \ shown \ in \ table \ 8.6.2.1.1.2-1$

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period\ intra_FDD_CRS_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement_Period}$ intra FDD CRS DRX as shown in table 8.6.2.1.1.2-1, when DRX is in use. The UE shall be capable of performing RSRP and

RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement_Period_intra_FDD_CRS_DRX}$.

Table 8.6.2.1.1.2-1: Requirement to measure FDD intra frequency cell

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period intra_FDD_CRS_DRX} [ms]
≥6	≥1	5 * Max{ T _{DMTC_periodicity} , DRX cycle length }
≥25	≥1	3 * Max{ T _{DMTC_periodicity} , DRX cycle length }

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.14.4.

8.6.2.1.1.2.1 Measurement Reporting Requirements

8.6.2.1.1.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

8.6.2.1.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8,6.2.1.1.2.1.3.

8.6.2.1.1.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_SCE_DRX}$ defined in Clause 8.6.2.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_SCE_DRX}$ defined in clause 8.6.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_intra_FDD_CRS_DRX}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.2.1.2 E-UTRAN TDD intra frequency measurements

8.6.2.1.2.1 E-UTRAN TDD intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra_SCE}$,

 $T_{identify_intra_SCE} = 12 * T_{DMTC_periodicity} + T_{Measurement_Period_intra_TDD_CRS}$

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.14.2 and RSRQ related side conditions given in Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

 $T_{DMTC_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

 $T_{Measurement_Period_intra_TDD_CRS} \ is \ the \ intra-frequency \ period \ for \ measurements$

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_intra_TDD_CRS}$ when no DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{\text{Measurement_Period}}$ _intra_TDD_CRS as shown in table 8.6.2.1.2.1-1, when no DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement_Period_intra_TDD_CRS}$

Table 8.6.2.1.2.1-1: Requirement to measure TDD intra frequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period intra_TDD_CRS} [ms]
≥6	≥2	5 * T _{DMTC_periodicity}
≥25	≥2	3 * T _{DMTC_periodicity}

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.14.2, and RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.14.4.

8.6.2.1.2.1.1 Measurement Reporting Requirements

8.6.2.1.2.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

8.6.2.1.2.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.2.1.2.1.1.3.

8.6.2.1.2.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_SCE}$ defined in Clause 8.6.2.1.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_SCE}$ defined in clause 8.6.2.1.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_intra_TDD_CRS}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.2.1.2.2 E-UTRAN TDD intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra_SCE_DRX}$.

 $T_{identify_intra_SCE_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + \ T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ \{ \ T_{DMTC_periodicity}, \ DRX \ cycle \ length \} + T_{Measurement_Period_intra_TDD_CRS_DRX} = 16* max \ length \} + T_{Measurement_P$

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.14.2 and RSRQ related side conditions given in Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

 $T_{DMTC_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period\ intra_TDD_\ CRS_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement_Period}$ _intra_TDD_CRS_DRX as shown in table 8.6.2.1.2.2-1, when DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement_Period_intra_TDD_CRS_DRX}$

 Measurement bandwidth[RB]
 Discovery signal occasion duration (ds-OccasionDuration) [ms]
 T_{Measurement_Period intra_TDD_CRS_DRX} [ms]

 ≥6
 ≥2
 5 * Max{ T_{DMTC_periodicity}, DRX cycle length }

 ≥25
 ≥2
 3 * Max{ T_{DMTC_periodicity}, DRX cycle length

Table 8.6.2.1.2.2-1: Requirement to measure TDD intra frequency cell

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.14.4.

8.6.2.1.2.2.1 Measurement Reporting Requirements

8.6.2.1.2.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

8.6.2.1.2.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.2.1.2.2.1.3.

8.6.2.1.2.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times \text{TTI}_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_SCE_DRX}$ defined in Clause 8.6.2.1.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_SCE_DRX}$ defined in clause 8.6.2.1.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_intra_TDD_CRS_DRX}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.2.2 E-UTRAN inter frequency measurements

The UE shall be able to identify new inter-frequency cells and perform RSRP and RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the PCell, even if no explicit neighbour list with physical layer cell identities is provided. The discovery signal occasion and the measurement gap should be aligned, provided that also the following additional conditions are fulfilled:

Entire discovery signal occasion should be contained in the measurement gap.

The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap.

8.6.2.2.1 E-UTRAN FDD – FDD inter-frequency measurements

8.6.2.2.1.1 E-UTRAN FDD – FDD inter frequency measurements when no DRX is used

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\ Inter\ SCE}$ according to the following expression:

 $T_{Identify_Inter_SCE} = \underline{13} * Max \{T_{DMTC_periodicity}, MGRP\} * N_{freq} + T_{Measurement_Period_inter_FDD_CRS}$

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1.14.2 and RSRQ related side conditions given in Sections 9.1.14.4 are fulfilled,
- SCH_RP|_{dBm} SCH Ês/Iot according to Annex B.2.11 for a corresponding Band,

 $T_{DMTC_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

 $T_{\text{Measurement_Period_intra_FDD_CRS}}$ is the inter-frequency period for measurements as shown in table 8.6.2.2.1.2-1. N_{freq} is defined in clause 8.1.2.1.1.

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.14.2 and 9.1.14.4, respectively, with measurement period given by table 8.6.2.3.1.1-1.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 3 identified inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.6.2.2.1.1-1 when no DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.6.2.2.1.1-1: Requirement to measure FDD inter frequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period inter_FDD_CRS} [ms]
≥6	≥1	5 * <i>Max</i> { T _{DMTC_periodicity} ,
≥25	≥1	3 * Max{ T _{DMTC_periodicity} , MGRP}*N _{frea}

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.14.4.

8.6.2.2.1.1.1 Measurement Reporting Requirements

8.6.2.2.1.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4,respectively.

8.6.2.2.1.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.2, and 9.1.14.4, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.2.2.1.1.1.3.

8.6.2.2.1.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify_Inter_SCE}$ defined in Clause 8.6.2.2.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify_Inter_SCE}$ defined in clause 8.6.2.2.1.1 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_inter_FDD_CRS}$ provided the timing to that cell has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.2.2.1.2 E-UTRAN FDD – FDD inter frequency measurements when DRX is used

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify\ inter\ SCE_DRX}$.

 $T_{identify_inter_SCE_DRX} = 17 * Max \{ T_{DMTC_periodicity}, DRX cycle length, MGRP \} * N_{freq} + T_{Measurement_Period_inter_FDD_CRS_DRX}$

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.14.2 and RSRQ related side conditions given in Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.11 for a corresponding Band

T_{DMTC} periodicity is the discovery signal measurement timing configuration periodicity of higher layer.

 $T_{Measurement_Period_inter_FDD_CRS_DRX}$ is the inter-frequency period for measurements as shown in Table 8.6.2.2.1.2-1. N_{freq} is defined in clause 8.1.2.1.1.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_inter_FDD_CRS_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 3 identified inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.6.2.2.1.2-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.6.2.2.1.2-1: Requirement to measure FDD interfrequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period} inter_FDD_CRS_DRX [ms]
≥6	≥1	5 * <i>Max</i> { T _{DMTC_periodicity} , DRX cycle length,MGRP}* <i>N</i> _{freq}
≥25	≥1	3 * <i>Max</i> { T _{DMTC_periodicity} , DRX cycle length,MGRP}* <i>N</i> _{freq}

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.14.4.

8.6.2.2.1.2.1 Measurement Reporting Requirements

8.6.2.2.1.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.2, and 9.1.14.4 respectively.

8.6.2.2.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.2 and 9.1.14.4 respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.2.2.1.2.1.3.

8.6.2.2.1.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.2, and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times \text{TTI}_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_inter_SCE\ DRX}$ defined in Clause 8.6.2.2.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_inter_SCE\ DRX}$ defined in clause 8.6.2.2.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_inter_FDD_CRS_DRX}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.2.2.2 E-UTRAN TDD – TDD inter frequency measurements

8.6.2.2.2.1 E-UTRAN TDD – TDD inter frequency measurements when no DRX is used

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\ Inter\ SCE}$ according to the following expression:

$$T_{identify_inter_SCE} = 13 * Max \{ T_{DMTC_periodicity}, MGRP \} * N_{freq} + T_{Measurement_Period_inter_TDD_CRS}$$

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1.14.2 and RSRQ related side conditions given in Sections 9.1.14.4 are fulfilled,
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.11 for a corresponding Band

 $T_{DMTC_periodicity} \ is \ the \ discovery \ signal \ measurement \ timing \ configuration \ periodicity \ of \ higher \ layer.$

 $T_{\text{Measurement_Period_inter_TDD_CRS}}$ is the inter-frequency period for measurements as shown in Table 8.6.2.2.2.1-1. N_{freq} is defined in clause 8.1.2.1.1.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.14.2, and 9.1.14.4, respectively, with measurement period $T_{\text{Measurement Period inter TDD CRS}}$ given by table 8.6.2.2.2.1-1:

Table 8.6.2.2.2.1-1: Requirement to measure TDD interfrequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period inter_TDD_CRS} [ms]
≥6	≥2	5 * <i>Max</i> { T _{DMTC_periodicity} , MGRP}* <i>N_{freq}</i>
≥25	≥2	3 * <i>Max</i> { T _{DMTC_periodicity} , MGRP}* <i>N</i> _{freq}

The UE shall be capable of performing RSRP and RSRQ measurements of at least 3 identified inter-frequency cells per FDD inter-frequency for up to 3TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.6.2.2.1.2-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

8.6.2.2.1.1 Measurement Reporting Requirements

8.6.2.2.2.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.2, and 9.1.14.4, respectively.

8.6.2.2.2.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.2, and 9.1.14.4, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.2.2.2.1.1.3.

8.6.2.2.2.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.2, and 9.1.14.4, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify_Inter}$ defined in clause 8.6.2.2.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify_Inter_SCE}$ defined in clause 8.6.2.2.2.1 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ inter_TDD_CRS}$ defined in clause 8.6.2.2.2.1 provided the timing to that cell has not changed more than \pm 50 Ts while measurementgap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.2.2.2.2 E-UTRAN TDD – TDD inter frequency measurements when DRX is used

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\ inter\ SCE\ DRX}$

 $T_{identify_inter_SCE_DRX} = 17 * \textit{Max} \; \{ \; T_{DMTC_periodicity}, \; DRX \; cycle \; length, \; MGRP \} \; *N_{freq} \; + T_{Measurement_Period_inter_TDD_CRS_DRX} \; | \; T_{identify_inter_SCE_DRX} \; |$

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1.14.2 and RSRQ related side conditions given in Sections 9.1.14.4 are fulfilled.
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.11 for a corresponding Band

T_{DMTC} periodicity is the discovery signal measurement timing configuration periodicity of higher layer.

 $T_{\text{Measurement_Period_inter_TDD_CRS_DRX}$ is the inter-frequency period for measurements as shown in Table 8.6.2.2.2-1. N_{freq} is defined in clause 8.1.2.1.1.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period\ intra_TDD_CRS_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 3 identified inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.6.2.2.1.2-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.6.2.2.2.1: Requirement to measure TDD interfrequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_} Period inter_TDD_CRS_DRX [ms]
≥6	≥2	5 * <i>Max</i> { T _{DMTC_periodicity} , DRX cycle length,MGRP}* <i>N_{freq}</i>
≥25	≥2	3 * <i>Max</i> { T _{DMTC_periodicity} , DRX cycle length,MGRP}* <i>N</i> _{freq}

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.14.4.

8.6.2.2.2.2.1 Measurement Reporting Requirements

8.6.2.2.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.2, and 9.1.14.4, respectively.

8.6.2.2.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.2, and 9.1.14.4, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.1.2.3.2.1.1.3.

8.6.2.2.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.2, and 9.1.14.4, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify_Inter}$ defined in clause 8.1.2.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_inter_SCE_DRX}$ defined in clause 8.6.2.2.2.2 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_inter_TDD_CRS_DRX}$ defined in clause 8.6.2.2.2.2 provided the timing to that cell has not changed more than \pm 50 Ts while measurementgap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.2.2.3 E-UTRAN TDD – FDD inter frequency measurements

8.6.2.2.3.1 E-UTRAN TDD – FDD inter frequency measurements when no DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.6.2.2.1.1 also apply for this section.

8.6.2.2.3.2 E-UTRAN TDD – FDD inter frequency measurements when DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.6.2.2.1.2 also apply for this section.

8.6.2.2.4 E-UTRAN FDD – TDD inter frequency measurements

8.6.2.2.4.1 E-UTRAN FDD – TDD inter frequency measurements when no DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.6.2.2.2.1 also apply for this section.

8.6.2.2.4.2 E-UTRAN FDD – TDD inter frequency measurements when DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.6.2.2.2.2 also apply for this section.

8.6.3 Requirements for CSI-RS based discovery signal measurements

8.6.3.1 E-UTRAN intra frequency measurements

The UE shall be able to identify new intra-frequency TPs and perform CSI-RSRP measurements of intra-frequency TPs with an explicit intra-frequency TP list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency TPs and additionally search for and identify new intra frequency TPs.

8.6.3.1.1 E-UTRAN FDD intra frequency measurements

8.6.3.1.1.1 E-UTRAN FDD intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency TP within $T_{identify_intra_TP_SCE}$,

 $T_{identify_intra_TP_SCE} = T_{identify_intra_SCE} + T_{Measurement_Period_intra_FDD_CSI-RS}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

 $T_{identify_intra_SCE}$ is the intra-frequency period for cell identification in section 8.6.2.1.1.1. $T_{Measurement_Period_intra_FDD_CSI-RS}$ is the intra-frequency period for TP measurement as shown in table 8.6.3.1.1.1-1.

Identification of a TP shall include identification of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_intra_FDD_CSI-RS}$ when no DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{\text{Measurement Period intra FDD CSI-RS}}$ as shown in table 8.6.3.1.1.1-1, when no DRX is in use. The UE shall be capable of

performing CSI-RSRP measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement_Period_intra_FDD_CSI-RS}$

Table 8.6.3.1.1.1-1: Requirement to measure FDD intra frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period_intra_FDD_CSI-RS} [ms]
≥ 6	≥1	5* T _{DMTC periodicity}
≥ 25	≥1	3* T _{DMTC periodicity}

T_{DMTC} periodicity is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the sub-clauses 9.1.14.3.

8.6.3.1.1.1.1 Measurement Reporting Requirements

8.6.3.1.1.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.3.

8.6.3.1.1.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.3.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.3.1.1.1.1.3.

8.6.3.1.1.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times \text{TTI}_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_TP_SCE}$ defined in Clause 8.6.3.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_intra_TP_SCE}$ defined in clause 8.6.3.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_intra_FDD_CSI_RS}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.3.1.1.2 E-UTRAN FDD intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency TP within $T_{identify\ intra\ TP\ SCE\ DRX}$.

 $T_{identify_intra_TP_SCE_DRX} = T_{identify_intra_SCE_DRX} + T_{Measurement_Period_intra_FDD_CSI-RS_DRX}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

 $T_{identify_intra_SCE_DRX}$ is the intra-frequency period for cell identification in section 8.6.2.1.1.2. $T_{Measurement_Period_intra_FDD_CSI-RS_DRX}$ is the intra-frequency period for TP measurement as shown in table 8.6.3.1.1.2-1.

Identification of a TP shall include identification of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_intra_FDD_CSI-RS_DRX}$ when DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{\text{Measurement_Period}}$ _intra_FDD_CSI-RS_DRX as shown in table 8.6.3.1.1.2-1, when DRX is in use. The UE shall be capable of performing CSI-RSRP measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement_Period_intra_FDD_CSI-RS_DRX}$.

Table 8.6.3.1.1.2-1: Requirement to measure FDD intra frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_} Period intra_FDD_ CSI-RS_DRX [ms]
≥ 6	≥1	5*Max{T _{DMTC periodicity} , DRX cycle length}
≥ 25	≥1	3*Max{T _{DMTC periodicity} , DRX cycle length}

 $T_{DMTC_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the sub-clauses 9.1.14.3.

8.6.3.1.1.2.1 Measurement Reporting Requirements

8.6.3.1.1.2.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.3.

8.6.3.1.1.2.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.3.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.3.1.1.2.1.3.

8.6.3.1.1.2.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_TP_SCE_DRX}$ defined in Clause 8.6.3.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_intra_TP_SCE_DRX}$ defined in clause 8.6.3.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the

event triggered measurement reporting delay shall be less than $T_{Measurement_Period_intra_FDD_CSI-RS_DRX}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.3.1.2 E-UTRAN TDD intra frequency measurements

8.6.3.1.2.1 E-UTRAN TDD intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency TP within $T_{identify_intra_TP_SCE}$,

 $T_{identify_intra_TP_SCE} = T_{identify_intra_SCE} + T_{Measurement_Period_intra_TDD_CSI-RS}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

 $T_{identify_intra_SCE}$ is the intra-frequency period for cell identification in section 8.6.2.1.2.1. $T_{Measurement_Period_intra_TDD_CSI-RS}$ is the intra-frequency period for TP measurement as shown in table 8.6.3.1.2.1-1.

Identification of a TP shall include identification of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_intra_TDD_CSI-RS}$ when no DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{\text{Measurement_Period intra_TDD_CSI-RS}}$ as shown in table 8.6.3.1.2.1-1, when no DRX is in use. The UE shall be capable of performing measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement_Period_intra_TDD_CSI-RS}}$

Table 8.6.3.1.2.1-1: Requirement to measure TDD intra frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period_intra_TDD_CSI-RS} [ms]
≥ 6	≥2	5* T _{DMTC_periodicity}
≥ 25	≥2	3* T _{DMTC_periodicity}

 $T_{DMTC_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the sub-clauses 9.1.14.3.

8.6.3.1.2.1.1 Measurement Reporting Requirements

8.6.3.1.2.1.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.3.

8.6.3.1.2.1.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.3.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.3.1.2.1.1.3.

8.6.3.1.2.1.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_TP_SCE}$ defined in Clause 8.6.3.1.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_intra_TP_SCE}$ defined in clause 8.6.3.1.2.1 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_intra_TDD_CSI_RS}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.3.1.2.2 E-UTRAN TDD intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency TP within $T_{identify_intra_TP_SCE_DRX}$.

 $T_{identify_intra_TP_SCE_DRX} = T_{identify_intra_SCE_DRX} + T_{Measurement_Period_intra_TDD_CSI-RS_DRX}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

 $T_{identify_intra_SCE_DRX} \ is \ the \ intra-frequency \ period \ for \ cell \ identification \ as \ shown \ in \ section \ 8.6.2.1.2.2.$ $T_{Measurement_Period_intra_TDD_CSI-RS_DRX} \ is \ the \ intra-frequency \ period \ for \ TP \ measurement \ as \ shown \ in \ table \ 8.6.3.1.2.2-1.$

Identification of a TP shall include identification of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_intra_TDD_CSI-RS_DRX}$ when DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement_Period}$ _intra_TDD_CSI-RS_DRX as shown in table 8.6.3.1.2.2-1, when DRX is in use. The UE shall be capable of performing CSI-RSRP measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement_Period_intra_TDD_CSI-RS_DRX}$

Table 8.6.3.1.2.2-1: Requirement to measure TDD intrafrequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period} intra_TDD_ CSI-RS_DRX [ms]
≥ 6	≥2	5*Max{T _{DMTC periodicity} , DRX cycle length}
≥ 25	≥2	3*Max{T _{DMTC periodicity} , DRX cycle length}

 $T_{DMTC_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the sub-clauses 9.1.14.3.

8.6.3.1.2.2.1 Measurement Reporting Requirements

8.6.3.1.2.2.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.3.

8.6.3.1.2.2.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.3.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.3.1.2.2.1.3.

8.6.3.1.2.2.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times \text{TTI}_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_TP_SCE_DRX}$ defined in Clause 8.6.3.1.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_intra_TP_SCE_DRX}$ defined in clause 8.6.3.1.2.2 becomes undetectable for a period \leq 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_intra_TDD_CSI_RS_DRX}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.3.2 E-UTRAN inter frequency measurements

The UE shall be able to identify new inter-frequency TPs and perform CSI-RSRP measurements of inter-frequency TP with an explicit inter-frequency TP list containing physical layer cell identities. The discovery signal occasion and the measurement gap should be aligned, provided that also the following additional conditions are fulfilled:

Entire discovery signal occasion should be contained in the measurement gap.

The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap.

8.6.3.2.1 E-UTRAN FDD – FDD inter frequency measurements

8.6.3.2.1.1 E-UTRAN FDD – FDD inter frequency measurements when no DRX is used

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new FDD inter-frequency TP within $T_{identify_inter_TP_SCE}$ according to the following expression:

 $T_{identify_inter_TP_SCE} = T_{identify_Inter_SCE} + T_{Measurement_Period_inter_FDD_CSI-RS}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.11 for a corresponding Band

 $T_{identify_inter_SCE}$ is the inter-frequency period for cell identification as shown in section 8.6.2.2.1.1. N_{freq} is defined in clause 8.1.2.1.1. $T_{Measurement_Period_inter_FDD_CSI-RS}$ is the inter-frequency period for TP measurement as shown in table 8.6.3.2.1.1-1.

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.14.3, with measurement period given by table 8.6.3.2.1.1-1.

The UE shall be capable of performing CSI-RSRP measurements of at least 3 identified inter-frequency TPs per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with the measurement period defined in table 8.6.3.2.1.1-1 when no DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.6.3.2.1.1-1: Requirement to measure FDD inter frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period} inter_FDD_ CSI-RS [ms]
≥ 6	≥1	5*Max{T _{DMTC_periodicity} , MGRP }*N _{freq}
≥ 25	≥1	$3*Max\{T_{DMTC_periodicity}, MGRP\}*N_{freq}$

T_{DMTC} periodicity is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the sub-clauses 9.1.14.3.

8.6.3.2.1.1.1 Measurement Reporting Requirements

8.6.3.2.1.1.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.3.

8.6.3.2.1.1.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.3.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8,6,3,2,1,1,1,3.

8.6.3.2.1.1.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_inter_TP_SCE}$ defined in Clause 8.6.3.2.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_inter_TP_SCE}$ defined in clause 8.6.3.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_inter_FDD_CSI-RS}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.3.2.1.2 E-UTRAN FDD – FDD inter frequency measurements when DRX is used

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency TP within $T_{identify\ inter\ TP\ SCE\ DRX}$ according to the following expression:

 $T_{identify_inter_TP_SCE_DRX} = T_{identify_inter_SCE_DRX} + T_{Measurement_Period_inter_FDD_CSI-RS_DRX}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.11 for a corresponding Band

 $T_{identify_inter_SCE_DRX}$ is the inter-frequency period for cell identification as shown in section 8.6.2.2.1.2. N_{freq} is defined in clause 8.1.2.1.1. $T_{Measurement_Period_inter_FDD_CSI-RS_DRX}$ is the inter-frequency period for TP measurement as shown in table 8.6.3.2.1.2-1.

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.14.3, with measurement period given by table 8.6.3.2.1.2-1.

The UE shall be capable of performing CSI-RSRP measurements of at least 3 identified inter-frequency TPs per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with the measurement period defined in table 8.6.3.2.1.2-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.6.3.2.1.2-1: Requirement to measure FDD inter frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_} Period inter_FDD_ CSI-RS_DRX [ms]
≥ 6	≥1	5*Max{T _{DMTC_periodicity} , DRX cycle length, MGRP}*N _{freq}
≥ 25	≥1	3*Max{T _{DMTC_periodicity} , DRX cycle length, MGRP}*N _{freq}

T_{DMTC} periodicity is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the sub-clauses 9.1.14.3.

8.6.3.2.1.2.1 Measurement Reporting Requirements

8.6.3.2.1.2.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.3 respectively.

8.6.3.2.1.2.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.3.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.3.2.1.2.1.3.

8.6.3.2.1.2.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_inter_TP_SCE_DRX}$ defined in clause 8.6.3.2.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_inter_TP_SCE_DRX}$ defined in clause 8.6.3.2.1.2 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_inter_FDD_CSI_RS_DRX}$ provided the timing to that TP has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.3.2.2 E-UTRAN TDD – TDD inter frequency measurements

8.6.3.2.2.1 E-UTRAN TDD – TDD inter frequency measurements when no DRX is used

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new TDD inter-frequency TP within $T_{identify_inter_TP_SCE}$ according to the following expression:

 $T_{identify_inter_TP_SCE} = T_{identify_inter_SCE} + T_{Measurement_Period_inter_TDD_CSI-RS}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.11 for a corresponding Band

 $T_{identify_inter_SCE}$ is the inter-frequency period for cell identification as shown in section 8.6.2.2.2.1. N_{freq} is defined in clause 8.1.2.1.1. $T_{Measurement_Period_inter_TDD_CSI-RS}$ is the inter-frequency period for TP measurement as shown in table 8.6.3.2.2.1-1.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.14.3, with measurement period given by table 8.6.3.2.2.1-1.

The UE shall be capable of performing CSI-RSRP measurements of at least 3 identified inter-frequency TP per TDD inter-frequency for up to 3TDD inter-frequencies and the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with the measurement period defined in table 8.6.3.2.2.1-1 when no DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.6.3.2.2.1-1: Requirement to measure TDD inter frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_} Period inter_TDD_ CSI-RS [ms]
≥ 6	≥2	5*Max{T _{DMTC periodicity} , MGRP}*N _{freq}
≥ 25	≥2	$3*Max\{T_{DMTC_periodicity}, MGRP \}*N_{frea}$

 $T_{DMTC_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the sub-clauses 9.1.14.3.

8.6.3.2.2.1.1 Measurement Reporting Requirements

8.6.3.2.2.1.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.3.

8.6.3.2.2.1.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.3.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.3.2.2.1.1.3.

8.6.3.2.2.1.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times \text{TTI}_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_inter_TP_SCE}$ defined in clause 8.6.3.2.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_inter_TP_SCE}$ defined in clause 8.6.3.2.2.1 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_inter_TDD_CSI-RS}$ provided the timing to that TP has not changed more than \pm 50 Ts while measurementgap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.3.2.2.2 E-UTRAN CSI-RS based TDD – TDD inter frequency measurements when DRX is used

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency TP within $T_{identify\ inter\ TP\ SCE\ DRX}$ according to the following expression:

 $T_{identify\ inter\ TP\ SCE\ DRX} = T_{identify\ inter\ SCE\ DRX} + T_{Measurement\ Period\ inter\ TDD\ CSI-RS\ DRX}$

A TP shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.11 for a corresponding Band

 $T_{identify_inter_SCE_DRX}$ is the inter-frequency period for cell identification as shown in section 8.6.2.2.2.2. N_{freq} is defined in clause 8.1.2.1.1. $T_{Measurement_Period_inter_TDD_CSI-RS_DRX}$ is the inter-frequency period for TP measurement as shown in table 8.6.3.2.2.2-1.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with measurement accuracy as specified in sub-clauses 9.1.14.3, with measurement period given by table 8.6.3.2.1.2-1.

The UE shall be capable of performing CSI-RSRP measurements of at least 3 identified inter-frequency TPs per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with the measurement period defined in table 8.6.3.2.2.2-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.6.3.2.2.2-1: Requirement to measure TDD inter frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{Measurement_Period} inter_TDD_ CSI-RS_DRX [ms]
≥ 6	≥2	5* <i>Max</i> {T _{DMTC_periodicity} , DRX cycle length, MGRP}* <i>N</i> _{freq}
≥ 25	≥2	3* <i>Max</i> {T _{DMTC_periodicity} , DRX cycle length, MGRP}* <i>N</i> _{freq}

T_{DMTC} periodicity is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the sub-clauses 9.1.14.3.

8.6.3.2.2.2.1 Measurement Reporting Requirements

8.6.3.2.2.2.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.14.3.

8.6.3.2.2.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.14.3.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.6.3.2.2.2.1.3.

8.6.3.2.2.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_inter_TP_SCE_DRX}$ defined in Clause 8.6.3.2.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_inter_TP_SCE_DRX}$ in clause 8.6.3.2.2.2 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_inter_TDD_CSI_RS_DRX}$ provided the timing to that TP has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.6.3.2.3 E-UTRAN TDD – FDD inter frequency measurements

8.6.3.2.3.1 E-UTRAN TDD – FDD inter frequency measurements when no DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.6.3.2.1.1 also apply for this section.

8.6.3.2.3.2 E-UTRAN TDD – FDD inter frequency measurements when DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.6.3.2.1.2 also apply for this section.

8.6.3.2.4 E-UTRAN FDD – TDD inter frequency measurements

8.6.3.2.4.1 E-UTRAN FDD – TDD inter frequency measurements when no DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.6.3.2.2.1 also apply for this section.

8.6.3.2.4.2 E-UTRAN FDD – TDD inter frequency measurements when DRX is used

The requirements in this clause shall apply to UE supporting FDD and TDD.

The requirements in clause 8.6.3.2.2.2 also apply for this section.

8.7 Discovery signal measurements for E-UTRA carrier aggregation

8.7.1 Introduction

Requirements in this clause are applicable to UE supporting E-UTRA FDD, E-UTRA TDD and/or E-UTRA TDD-FDD carrier aggregation.

Non configured frequencies may be measured with measurement gaps according to the requirements in clause 8.6.2.2 and clause 8.6.3.2 (E-UTRAN CRS based inter frequency measurements and E-UTRAN CSI-RS based inter frequency measurements).

8.7.2 Requirements for CRS based discovery signal measurements for E-UTRA carrier aggregation

8.7.2.1 Measurements of the primary component carrier

CRS based measurements of cells on the primary component carrier shall meet all applicable requirements (FDD or TDD) in clause 8.6.2.1.

8.7.2.2 Measurements of a secondary component carrier

A Secondary component carrier may be activated and deactivated by MAC-CE commands as specified in [17]. The applicable performance requirements depend on whether the SCell on the corresponding frequency is actived or deactivated.

8.7.2.3 Measurements of a secondary component carrier with active SCell

When the SCell is activated, measurement performance requirements for the frequency are those given in clause 8.6.2.1. If common DRX is in use, then the requirements for that secondary component carrier are given by the applicable DRX

requirements (FDD or TDD) in clause 8.6.2.1, otherwise the non DRX requirements are applicable. The applicable measurement accuracy requirements are in clause 9.1.15.

8.7.2.4 Measurements of a secondary component carrier with deactivated SCell

This clause defines the measurement requirements of a secondary component carrier with deactivated SCell based on the parameter *measCycleSCell* defined in TS 36.331 [2].

8.7.2.4.1 E-UTRAN secondary component carrier measurements when no common DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify_scc_SCE}$, according to the parameter measCycleSCell where $T_{identify_scc_CRS} = 13 *measCycleSCell + T_{measure_scc_CRS}$

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1.15 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure_scc_CRS}$ according to the parameter measCycleSCell shown in Tables 8.7.2.4.1-1 and 8.7.2.4.1-2.

Table 8.7.2.4.1-1: Requirement to measure intra frequency cell on FDD SCC with deactivated SCell

	Measurement bandwidth[RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_scc_CRS} [ms]
	≥6	≥1	5* measCycleSCell
ĺ	≥25	≥1	3 * measCycleSCell

Table 8.7.2.4.1-2: Requirement to measure intra frequency cell on TDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_scc_CRS} [ms]
≥6	≥2	5* measCycleSCell
≥25	≥2	3 * measCycleSCell

The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{measure_scc_CRS}}$.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.15.

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on up to four SCCs with deactivated SCell. This may cause interruptions on PCell or activated SCell(s) or both that are specified in Section 7.8.

8.7.2.4.1.1 Measurement Reporting Requirements

8.7.2.4.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in clause 9.

8.7.2.4.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic CRS based measurement reporting shall meet the requirements specified in clause 8.7.2.4.1.1.3.

8.7.2.4.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_scc_CRS}$ defined in Clause 8.7.2.4.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_scc_SCE}$ defined in clause 8.7.2.4.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_scc_CRS}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.7.2.4.2 E-UTRAN secondary component carrier measurements when common DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify_scc}$, according to the parameter measCycleSCell where $T_{identify_scc_SCE_DRX} = 17*Max(measCycleSCell$, DRX cycle length)+ $T_{measure_scc_CRS_DRX}$.

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1.15 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure_scc_CRS_DRX}$ according to the parameter *measCycleSCell* shown in Tables 8.7.2.4.2-1 and 8.7.2.4.2-1.

Table 8.7.2.4.2-1: Requirement to measure intrafrequency cell on FDD SCC with deactivated SCell

Measurement bandwidth[RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_scc_CRS_DRX} [ms]
≥6	≥1	5* Max{ measCycleSCell, DRX cycle length }
≥ 25	≥1	3 * Max{ measCycleSCell, DRX cycle length }

Table 8.7.2.4.2-2: Requirement to measure intrafrequency cell on TDD SCC with deactivated SCell

Measurement bandwidth[RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_scc_CRS_DRX} [ms]
≥6	≥2	5* Max{ measCycleSCell, DRX cycle length }
≥25	≥2	3 * Max{ measCycleSCell, DRX cycle length }

The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_scc_CRS_DRX}$.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.15.

A UE may reconfigure receiver bandwidth taking into account the SCell activation/deactivation status, and when making measurements of cells on up to four SCCs with deactivated SCell. This may cause interruptions (packet drops) to a PCell or activated SCell(s) or both when the PCell and the SCell belong to the same frequency band. No interruptions while the On Duration timer is running shall be allowed when common DRX is used. The requirement considers only interruptions due to reconfiguration of the receiver bandwidth, and not due to other causes such as RF impairments or channel conditions.

8.7.2.4.2.1 Measurement Reporting Requirements

8.7.2.4.2.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in clause 9.

8.7.2.4.2.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.7.2.4.2.1.3.

8.7.2.4.2.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered CRS based measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_scc_CRS}$ defined in Clause 8.7.2.4.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_scc_SCE_DRX}$ defined in clause 8.7.2.4.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_scc_CRS_DRX}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.7.3 Requirements for CSI-RS based discovery signal measurements for E-UTRA carrier aggregation

8.7.3.1 Measurements of the primary component carrier

Measurements of cells on the primary component carrier shall meet all applicable requirements (FDD or TDD) in clause 8.6.3.1.

8.7.3.2 Measurements of a secondary component carrier

A Secondary component carrier may be activated and deactivated by MAC-CE commands as specified in [17]. The applicable performance requirements depend on whether the SCell on the corresponding frequency is actived or deactivated.

8.7.3.3 Measurements of a secondary component carrier with active SCell

When the SCell is activated, measurement performance requirements for the frequency are those given in clause 8.6.3.1. If common DRX is in use, then the requirements for that secondary component carrier are given by the applicable DRX requirements (FDD or TDD) in clause 8.6.3.1, otherwise the non DRX requirements are applicable. The applicable measurement accuracy requirements are in clause 9.1.15.

8.7.3.4 Measurements of a secondary component carrier with deactivated SCell

This clause defines the measurement requirements of a secondary component carrier with deactivated SCell based on the parameter *measCycleSCell* defined in TS 36.331 [2].

8.7.3.4.1 E-UTRAN secondary component carrier measurements when no common DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD TP on a secondary component carrier within $T_{identify_scc_TP_SCE}$, according to the parameter measCycleSCell, where $T_{identify_scc_TP_SCE} = T_{identify_scc_SCE} + T_{measure_scc_CSI-RS}$,

A cell shall be considered detectable when

- CSI-RSRP related side condition given in Clause 9.1.15 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

 $T_{identify_scc_SCE}$ is the intra-frequency period for cell identification in section 8.7.2.4.1. $T_{measure_scc_CSI-RS}$ is the intra-frequency period for TP measurement in table 8.7.3.4.1-1.

The measurement period for deactivated scell measurements is $T_{measure_scc_CSI-RS}$ according to the parameter *measCycleSCell* as shown in tables 8.7.3.4.1-1 and 8.7.3.4.1-1.

Table 8.7.3.4.1-1: Requirement to measure intra frequency TP on FDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_scc_CSI-RS} [ms]
≥ 6	≥1	5* measCycleSCell
≥ 25	≥1	3* measCycleSCell

Table 8.7.3.4.1-2: Requirement to measure intra frequency TP on TDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (<i>ds-OccasionDuration</i>) [ms]	T _{measure_scc_CSI-RS} [ms]
≥ 6	≥2	5* measCycleSCell
≥ 25	≥2	3* measCycleSCell

The UE shall be capable of performing RSRP measurements for 3 identified TPs on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{measure_scc_CSI-RS}}$.

The measurement accuracy for all measured TPs shall be as specified in the sub-clause 9.1.15.

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on up to four SCCs with deactivated SCell. This may cause interruptions on PCell or activated SCell(s) or both that are specified in Section 7.8.

8.7.3.4.1.1 Measurement Reporting Requirements

8.7.3.4.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in clause 9.

8.7.3.4.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.7.3.4.1.1.3.

8.7.3.4.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_scc_TP_SCE}$ defined in Clause 8.7.3.4.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_scc_TP_SCE}$ defined in clause 8.7.3.4.1 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_scc_CSI-RS}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.7.3.4.2 E-UTRAN secondary component carrier measurements when common DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD or TDD TP on a secondary component carrier within $T_{identify_scc_TP_SCE_DRX}$, according to the parameter measCycleSCell, where $T_{identify_scc_TP_SCE_DRX} = T_{identify_scc_CSCE_DRX} + T_{measure_scc_CSI-RS_DRX}$,

A cell shall be considered detectable when

- CSI-RSRP related side condition given in Clause 9.1.15 are fulfilled for a corresponding Band,
- SCH RP_{|dBm} and SCH Ês/Iot according to Annex B.2.10 for a corresponding Band

 $T_{identify_scc_SCE_DRX}$ is the intra-frequency period for cell identification in section 8.7.2.4.2. $T_{measure_scc_CSI-RS_DRX}$ is the intra-frequency period for TP measurement in table 8.7.3.4.2-1.

The measurement period for deactivated scell measurements is $T_{measure_scc_CSI-RS_DRX}$ according to the parameter *measCycleSCell* as shown in tables 8.7.3.4.2-1 and 8.7.3.4.2-2.

Table 8.7.3.4.2-1: Requirement to measure intrafrequency TP on FDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_scc_TP_SCE_DRX} [ms]
≥ 6	≥1	5* max {measCycleSCell, DRX cycle length }
≥ 25	≥1	3* max {measCycleSCell, DRX cycle length }

Table 8.7.3.4.2-1: Requirement to measure intrafrequency TP on TDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_scc_TP_SCE_DRX} [ms]
≥ 6	≥2	5* max {measCycleSCell, DRX cycle length }
≥ 25	≥2	3* max {measCycleSCell, DRX cycle length }

The UE shall be capable of performing CSI-RSRP measurements for 3 identified TPs on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{measure scc CSI-RS DRX}}$.

The measurement accuracy for all measured TPs shall be as specified in the sub-clause 9.1.15.

A UE may reconfigure receiver bandwidth taking into account the SCell activation/deactivation status, and when making measurements of TPs on up to four SCCs with deactivated SCell. This may cause interruptions (packet drops) to a PCell or activated SCell(s) or both when the PCell and the SCell belong to the same frequency band. No interruptions while the On Duration timer is running shall be allowed when common DRX is used. The requirement considers only interruptions due to reconfiguration of the receiver bandwidth, and not due to other causes such as RF impairments or channel conditions.

8.7.3.4.2.1 Measurement Reporting Requirements

8.7.3.4.2.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in clause 9.

8.7.3.4.2.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in clause 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.7.3.4.2.1.3.

8.7.3.4.2.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_scc_TP_SCE_DRX}$ defined in Clause 8.7.3.4.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_scc_TP_SCE_DRX}$ defined in clause 8.7.3.4.2 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_scc_CSI-RS_DRX}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.8 Measurements for E-UTRA dual connectivity

8.8.1 Introduction

This clause contains requirements for UE supporting E-UTRA dual connectivity. Requirements in this clause are applicable to UEs which have been configured with one SCell in either MCG or SCG and one PSCell for inter-band dual connectivity. Requirements in this clause are applicable to E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD dual connectivity.

8.8.2 Intra-frequency measurements requirements on PCell

PCell intra-frequency measurements shall meet all applicable requirements in clause 8.1.2.2. If MCG DRX is in use, then the PCell intra-frequency requirements for when DRX is in use in clause 8.1.2.2 shall apply and shall depend on the MCG DRX cycle. Otherwise, the requirements for when DRX is not in use shall apply. The applicable measurement accuracy requirements are in clause 9.1.

8.8.3 Intra-frequency measurements requirements on PSCell

PSCell starts with activated state upon configuration and cannot be deactivated. PSCell intra-frequency measurements shall meet all applicable requirements in clause 8.1.2.2. If SCG DRX is in use, then the PSCell intra-frequency requirements for when DRX is in use in clause 8.1.2.2 shall apply and shall depend on the SCG DRX cycle. Otherwise, the requirements for when DRX is not in use shall apply. The applicable measurement accuracy requirements are in clause 9.1.

8.8.4 Inter-frequency and inter-RAT measurement requirements

Inter-frequency measurements shall meet all applicable requirements in clause 8.1.2.3. If MCG DRX is in use, then the inter-frequency requirements for when DRX is in use in clause 8.1.2.3 shall apply and shall depend on the MCG DRX cycle. Otherwise, the requirements for when DRX is not in use shall apply. The applicable measurement accuracy requirements are in clause 9.1.

Inter-RAT measurements shall meet all applicable requirements in clause 8.1.2.4. If MCG DRX is in use, then the inter-RAT requirements for when DRX is in use in clause 8.1.2.4 shall apply and shall depend on the MCG DRX cycle. Otherwise, the requirements for when DRX is not in use shall apply. The applicable measurement accuracy requirements are in clause 9.2, 9.3, 9.4 and 9.5.

8.8.5 Intra-frequency measurements with autonomous gaps

8.8.5.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in both MCG and SCG in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or whether the SCell is configured, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\ CGI,\ intra} = T_{basic\ identify\ CGI,\ intra}$$
 ms

where

 $T_{basic_identify_CGI,\;intra} = 150\;ms.$ This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex B.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided that the PBCH demodulation requirements in [5] are met.

The requirement for identifying a new CGI of an E-UTRA cell within T_{basic_identify_CGI,intra} is applicable when no DRX is used as well as when any of the DRX cycles specified in TS 36.331 [2] is used.

Within the time $T_{identify_CGI,\,intra}$ ms, over which the UE identifies the CGI of a new E-UTRA cell, the UE shall transmit at least a minimum number of ACK/NACKs on cells in MCG and SCG, respectively, as specified in Table 8.8.5.1-1. The requirement depends on duplex mode, dual connectivity mode of operation, and whether a cell belongs to MCG or SCG, and is further conditioned on:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured.

Table 8.8.5.1-1: Requirement on minimum number of ACK/NACKs to transmit during Tidentify_CGI, intra-

Serving cell configuration	Minimum number of transmitted ACK/NACI		K/NACKs	
	Synchrono	us operation	Asynchronous operation	
	MCG	SCG	MCG	SCG
FDD	60		60	49
TDD UL/DL configuration 0	18		N/A	N/A
TDD UL/DL configuration 1	35		N/A	N/A
TDD UL/DL configuration 2	43		N/A	N/A
TDD UL/DL configuration 3	36		N/A	N/A
TDD UL/DL configuration 4	39		N/A	N/A
TDD UL/DL configuration 5	42		N/A	N/A
TDD UL/DL configuration 6	30		N/A	N/A

8.8.5.2 ECGI reporting delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.8.6 Inter-frequency measurements with autonomous gaps

8.8.6.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in both MCG and SCG in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or whether the SCell is configured, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify_CGI, inter} = T_{basic_identify_CGI, inter} ms$$

where

 $T_{basic_identify_CGI, inter} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided that the PBCH demodulation requirements in [5] are met.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI,inter}$ is applicable when no DRX is used as well as when any of the DRX cycles specified in TS 36.331 [2] is used.

Within the time $T_{identify_CGI,inter}$ ms, over which the UE identifies the CGI of a new E-UTRA cell, the UE shall transmit at least a minimum number of ACK/NACKs on cells in MCG and SCG, respectively, as specified in Table 8.8.6.1-1. The requirement depends on duplex mode, dual connectivity mode of operation, and whether a cell belongs to MCG or SCG, and is further conditioned on:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured.

Table 8.8.6.1-1: Requirement on minimum number of ACK/NACKs to transmit during Tidentify CGI, inter-

Serving cell configuration	Minimum number of transmitted ACK/NACKs			
	Synchronous operation		Asynchrono	us operation
	MCG	SCG	MCG	SCG
FDD	60		60	49
TDD UL/DL configuration 0	18		N/A	N/A
TDD UL/DL configuration 1	30		N/A	N/A

8.8.6.2 ECGI reporting delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.8.7 SSTD Measurements

8.8.7.1 Introduction

This clause contains SSTD measurement requirements on UE capabilities for support of E-UTRA dual connectivity.

8.8.7.2 SSTD Measurement requirements

When no DRX is used the physical layer measurement period of the SSTD measurement shall be $T_{measure_SSTD1} = 200$ ms.

When either MCG DRX or SCG DRX is used, or both MCG DRX and SCG DRX are used in RRC_CONNECTED state the physical layer measurement period ($T_{measure_SSTD1}$) of the SSTD measurement shall be as specified in table 8.8.7.2-1.

Table 8.8.7.2-1: SSTD measurement requirement when DRX is used

DRX cycle length (s)		T _{measure_SSTD1} (s) (DRX cycles)	
	≤0.04	0.2 (Note1)	
0.04 <drx-cycle≤2.56 (5)<="" note2="" td=""><td>Note2 (5)</td></drx-cycle≤2.56>		Note2 (5)	
Note1:	Note1: Number of DRX cycle depends upon the DRX cycle in use		
Note2:	lote2: Time depends upon the DRX cycle in use		
Note3:	Note3: DRX cycle length in this table refers to the DRX cycle length		
	configured on the CG in which DRX is used. When DRX is used in		
	both MCG and SCG, DRX cycle length in this table refers to the longer		
	DRX cycle length between MCG DRX and SCG DRX.		

If PCell is changed without changing PCC, and/or if PSCell is changed without changing a frequency of PSCell or if both PCell and PSCell are change by swapping the PCC with the frequency of PSCell while the UE is performing SSTD measurements, then the UE shall also meet the SSTD measurement and accuracy requirements corresponding to the new PCell and/or PSCell. However in this case the UE shall restart the SSTD measurement. In this case the total physical layer measurement period of the SSTD measurement shall not exceed $T_{measure_SSTD2}$ as defined in the following expression:

$$T_{\text{measure SSTD2}} = (N+M+1)*(T_{\text{measure SSTD1}}) + N*T_{\text{PCell change DC}} + M*T_{\text{PSCell change DC}}$$

Where:

N is the number of times the PCell is changed over the measurement period (T_{measure SSTD2}),

M is the number of times the PSCell is changed over the measurement period (T_{measure SSTD2}),

T_{PCell change DC} is the time necessary to change the PCell; it can be up to 25 ms,

 $T_{PSCell\ change\ DC}$ is the time necessary to change the PSCell; it can be up to 25 ms.

The measurement accuracy for the SSTD measurement when DRX is used as well as when no DRX is used shall be as specified in the sub-clause 9.1.20.

8.8.7.3 SSTD Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in subclause 9.1.20.

8.8.8 Intra-frequency measurements requirements on SCell

SCell intra-frequency measurements shall meet all applicable requirements in clause 8.3.3. In case where the SCell belongs to MCG, the term "common DRX" in clause 8.3.3 shall be deemed to be replaced with "MCG DRX". In case where the SCell belongs to SCG, the term "common DRX" and PCell in clause 8.3.3 shall be replaced with "SCG DRX" and PSCell, respectively.

8.9 MBSFN Measurements

8.9.1 Introduction

The requirements specified in Section 8.9 apply for MBSFN measurements (MBSFN RSRP, MBSFN RSRQ, and MCH BLER defined in [4]), which are performed in RRC_CONNECTED and logged for MDT by UEs which are MBMS-capable and also indicate their MBSFN measurement logging capability [2].

UE shall measure MBSFN RSRP, MBSFN RSRQ and MCH BLER only in subframes and on carriers where UE is decoding PMCH. The requirements are specified for any carrier where PMCH is received by UE. The requirements

specified in this section apply for any carrier frequency with configured MBSFN subframes with PMCH, which may be the same as or different from any serving unicast carrier.

The UE receiving PMCH on any non-serving carrier and performing MBSFN measurements shall not cause interruptions on any serving carrier in unicast subframes and in the subframes with non-MBSFN multicast transmissions such as system information.

8.9.2 MBSFN RSRP Measurements

The UE physical layer shall be capable of performing the MBSFN RSRP measurement [4] within the MBSFN RSRP measurement period and report the measurement, while meeting the MBSFN RSRP measurement accuracy requirements specified in section 9.8.2.

The MBSFN RSRP measurement period is defined as the maximum between 640ms and the period during which the UE decodes [5, Section 10] 5 subframes containing PMCH transmissions.

The MBSFN RSRP measurement period is the same for UE using any DRX cycle, any eDRX_CONN cycle, or no DRX.

8.9.3 MBSFN RSRQ Measurements

The UE physical layer shall be capable of performing the MBSFN RSRQ measurement [4] within the MBSFN RSRP measurement period and report the measurement, while meeting the MBSFN RSRQ measurement accuracy requirements specified in section 9.8.3.

The MBSFN RSRQ measurement period is defined as the maximum between 640ms and the period during which the UE decodes [5, Section 10] 5 subframes containing PMCH transmissions.

The MBSFN RSRQ measurement period is the same for UE using any DRX cycle, any eDRX_CONN cycle, and no DRX.

8.9.4 MCH BLER Measurements

The UE physical layer shall be capable of performing and reporting the MCH BLER measurement [4] to higher layers within the MCH BLER measurement period. The MCH BLER measurement reporting is according to section 9.8.4.

The MCH BLER measurement period is equal to the MBSFN logging interval configured by higher layers [2].

8.10 Proximity-based Services

8.10.1 Introduction

This section contains the requirements for the UE capable of ProSe Direct Communication and/or ProSe Direct Discovery in RRC_CONNECTED state.

8.10.2 Requirements

When a UE in RRC_CONNECTED state is performing transmissions and/or reception for ProSe Direct Discovery and/or ProSe Direct Communication, the UE shall meet all the requirements specified in Section 8.

Note: The UE may need to interrupt ProSe operation in order to meet the measurement requirements of Section 8.

8.10.2.1 Initiation/Cease of SLSS transmissions with ProSe Direct Discovery

The requirements in this subclause are applicable to a UE capable of ProSe Direct Discovery and SLSS transmission and reception.

The requirements apply when the conditions for SLSS transmissions specified in [2] are met; *networkControlledSyncTx* is not configured; and *syncTxThreshIC* is included in *SystemInformationBlockType19*. The UE shall be capable of measuring the RSRP of the cell used to transmit Prose Direct Discovery announcements and evaluate to initiate/cease SLSS transmissions within T_{evaluate,SLSS} where,

- $T_{\text{evaluate.SLSS}} = 0.4$ seconds when UE is not configured with DRX, or,
- $T_{evaluate,SLSS}$ = as specified in Table 8.10.2.1-1 when UE is configured with DRX.

Table 8.10.2.1-1: T_{evaluate,SLSS} with ProSe Direct Discovery

DRX cycle length [s]		T _{evaluate,SLSS} [s] (number of DRX cycles)
≤0.04 0.4 (Note 1)		
0.04 <drx-cycle≤2.56 (6)<="" 2="" note="" td=""><td>Note 2 (6)</td></drx-cycle≤2.56>		Note 2 (6)
Note1:	Number of DRX cycles depends upon the	
	DRX cycle in use	
Note2:	Time depends upon the DRX cycles in use	

If higher layer filtering is configured, an additional delay in evaluation to initiate/cease SLSS transmissions can be expected.

For the cell used to transmit ProSe Direct Discovery announcements:

- RSRP related side conditions given in Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in Clause 9.1.5.1 for a corresponding Band are fulfilled,
- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band are fulfilled.

8.10.2.2 Initiation/Cease of SLSS transmissions with ProSe Direct Communication

The requirements in this subclause are applicable to a UE capable of ProSe Direct Communication.

The requirements apply when the conditions for SLSS transmissions specified in [2] are met; networkControlledSyncTx is not configured; and syncTxThreshIC is included in SystemInformationBlockType18. The UE shall be capable of measuring the RSRP of the cell used to transmit Prose Direct Communication to evaluate to initiate/cease SLSS transmissions within $T_{evaluate,SLSS}$

where.

- $T_{evaluate,SLSS} = 0.4$ seconds when UE is not configured with DRX.
- $T_{evaluate,SLSS}$ = as specified in Table 8.10.2.2-1 when UE is configured with DRX.

Table 8.10.2.2-1: Tevaluate SLSS with ProSe Direct Communication

DRX cycle length [s]		T _{evaluate,SLSS} [s] (number of DRX cycles)
≤0.04 0.4 (Note 1)		0.4 (Note 1)
0.04 <drx-cycle≤2.56< td=""><td>Note 2 (6)</td></drx-cycle≤2.56<>		Note 2 (6)
Note1:	Number of DRX cycles depends upon the DRX cycle in use	
Note2:	Time depends upon the DRX cycles in use	

If higher layer filtering is configured, an additional delay in evaluation to initiate/cease SLSS transmissions can be expected.

For the cell used to transmit ProSe Direct Communication:

- RSRP related side conditions given in Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in Clause 9.1.5.1 for a corresponding Band are fulfilled,

- SCH_RP and SCH Ês/Iot according to Annex B.2.1 for a corresponding Band are fulfilled.

8.11 Discovery Signal Measurements under Operation with Frame Structure 3

8.11.1 Introduction

This section contains requirements on the UE for measurement reporting in RRC_CONNECTED state when discovery signal [16] is configured. The requirements are specified for E-UTRA CRS based discovery signal measurements and CSI-RS based discovery signal measurements.

The requirements in Section 8.11.2 shall apply for CRS based discovery signal measurements comprising RSRP and RSRQ measurements [4]. The requirements in Section 8.11.3 shall apply for CSI-RS based discovery signal measurements comprising CSI-RSRP measurements [4].

The measurement quantities are defined in [4], the measurement model is defined in [22] and measurement accuracy requirements are specified in Section 9. Control of measurement reporting is specified in TS 36.331 [2].

The requirements in this Section shall apply for carrier with E-UTRA operation following the frame structure type 3 [16].

The requirements in Section 9 are applicable for a UE performing measurements according to Section 8.11.

8.11.2 CRS based discovery signal measurements

8.11.2.1 E-UTRAN intra-frequency measurements

NOTE: The requirements in this section are applicable only for measurements on SCC following the frame structure type 3 [16].

The UE shall be able to identify new intra-frequency FS3 cells and perform measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra-frequency cells and additionally search for and identify new intra-frequency cells.

8.11.2.1.1 Requirements

8.11.2.1.1.1 Requirements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency cell within T_{identify_intra_FS3},

 $T_{identify_intra_FS3} = T_{detect\ intra_FS3} + T_{measure\ intra_FS3_CRS}$

where:

T_{detect intra} ES3 is the intra-frequency period for cell detection as specified in Table 8.11.2.1.1.1-1,

 $T_{measure_intra_FS3_CRS} \ is \ the \ intra-frequency \ period \ for \ measurements \ as \ shown \ in \ Table \ 8.11.2.1.1.1-2,$

T_{DMTC periodicity} is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions which are not available during $T_{\text{detect intra}_FS3}$ for cell detection at the UE due to the absence of the necessary radio signals,

M is the number of configured discovery signal occasions which are not available during $T_{measure_intra_FS3_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals.

Table 8.11.2.1.1.1-1: Intra-frequency cell detection under operation with frame structure 3

SCH Ês/lot	T _{detect intra_FS3} , [ms]
[0] ≤ SCH Ês/lot	([1]+L) * T _{DMTC_periodicity}
[-6] ≤ SCH Ês/lot < [0]	([4]+L) * T _{DMTC_periodicity}

A cell shall be considered detectable when

- RSRP related side conditions given in Section 9.1.18.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Section 9.1.18.3 are fulfilled for a corresponding Band,
- SCH_RP is according to Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.11.2.1.1.1-1.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure_intra_FS3_CRS}$ when no DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure_intra_FS3_CRS}$ as shown in Table 8.11.2.1.1.1-2, when no DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure_intra_FS3_CRS}$.

Table 8.11.2.1.1.1-2: Intra-frequency measurement requirements under operation with frame structure 3

Measurement bandwidth [RB]	CRS Ës/lot	Discovery signal occasion duration (ds- OccasionDuration) [ms]	T _{measure_intra_FS3_CRS} [ms]
≥6	[0] ≤ CRS Ês/lot	1	([3]+M) * T _{DMTC_periodicity}
≥6	[-6] ≤ CRS Ês/lot < [0]	1	([5]+M) * T _{DMTC_periodicity}
≥25	[0] ≤ CRS Ês/lot	1	([1]+M) * T _{DMTC_periodicity}
≥ 25	[-6] ≤ CRS Ês/lot < [0]	1	([3]+M) * T _{DMTC_periodicity}

The RSRP measurement accuracy for all measured cells shall be as specified in Section 9.1.18.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in Section 9.1.18.3.

8.11.2.1.1.1.1 Measurement Reporting Requirements

8.11.2.1.1.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in Sections 9.1.18.2 and 9.1.18.3, respectively.

8.11.2.1.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in Sections 9.1.18.2 and 9.1.18.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in Section 8.11.2.1.1.1.3.

8.11.2.1.1.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in Sections 9.1.18.2 and 9.1.18.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the

measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_FS3}$ defined in Section 8.11.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_FS3}$ defined in Section 8.11.2.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_FS3_CRS}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.11.2.1.1.2 Requirements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency cell within $T_{identify_intra_FS3_DRX}$.

 $T_{identify_intra_FS3_DRX} = T_{detect_intra_FS3_DRX} + T_{measure_intra_FS3_CRS_DRX},$

where:

T_{detect intra} FS_{3 DRX} is the intra-frequency period for cell detection as shown in Table 8.11.2.1.1.2-1,

T_{measure intra FS3 CRS DRX} is the intra-frequency period for measurements as shown in Table 8.11.2.1.1.2-2,

T_{DMTC} periodicity is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions during ON DURATION and which are not available during $T_{\text{detect intra ES3 DRX}}$ for cell detection at the UE due to the absence of the necessary radio signals,

M is the number of configured discovery signal occasions during ON DURATION and which are not available during $T_{measure_intra_FS3_CRS_DRX}$ for the measurements at the UE due to the absence of the necessary radio signals.

Table 8.11.2.1.1.2-1: Intra-frequency cell detection under operation with frame structure 3

SCH Ês/lot	T _{detect intra_FS3_CRS_DRX} , [ms]
[0] ≤ SCH Ês/lot	(TBD+L) * Max{ T _{DMTC_periodicity} , DRX cycle length }
[-6] ≤ SCH Ês/lot < [0]	(TBD+L) * Max{ T _{DMTC_periodicity} , DRX cycle length }

A cell shall be considered detectable when

- RSRP related side conditions given in Section 9.1.18.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Section 9.1.18.3 are fulfilled for a corresponding Band,
- SCH_RP is according to Annex B.2.12 for a corresponding Band and SCH £s/Iot is according to Table 8.11.2.1.1.2-1.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure_intra_FS3_CRS_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure_intra_FS3_CRS_DRX}$ as shown in Table 8.11.2.1.1.2-2, when DRX is in use. The UE shall be capable of p performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure_intra_FS3_CRS_DRX}$.

Table 8.11.2.1.1.2-2: Intra-frequency measurement requirements under operation with frame structure 3

Measurement bandwidth [RB]	CRS Ês/lot	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_intra_FS3_CRS_DRX} , [ms]
≥6	[0] ≤ CRS Ês/lot	1	([3]+M) * Max{ T _{DMTC_periodicity} , DRX cycle length }
≥6	[-6] ≤ CRS Ês/lot < [0]	1	([5]+M) * Max{ T _{DMTC_periodicity} , DRX cycle length }
≥25	[0] ≤ CRS Ês/lot	1	([1]+M) * Max{ T _{DMTC_periodicity} , DRX cycle length }
≥25	[-6] ≤ CRS Ês/lot < [0]	1	([3]+M) * Max{ T _{DMTC_periodicity} , DRX cycle length }

The RSRP measurement accuracy for all measured cells shall be as specified in Section 9.1.18.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in Section 9.1.18.3.

8.11.2.1.1.2.1 Measurement Reporting Requirements

8.11.2.1.1.2 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in Sections 9.1.18.2 and 9.1.18.3, respectively.

8.11.2.1.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in Sections 9.1.18.2 and 9.1.18.3, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in Section 8.11.2.1.1.2.1.3.

8.11.2.1.1.2.1.3 Event Triggered Reporting

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in Sections 9.1.18.2 and 9.1.18.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_FS3_DRX}$ defined in Section 8.11.2.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_FS3_DRX}$ defined in Section 8.11.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measuer_intra_FS3_CRS_DRX}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.11.2.2 E-UTRAN inter-frequency measurements

Editor's note: the requirements are TBD.

8.11.3 CSI-RS based discovery signal measurements

8.11.3.1 E-UTRAN intra-frequency measurements

The UE shall be able to identify new intra-frequency FS3 TPs and perform CSI-RSRP measurements of intra-frequency TPs with an explicit intra-frequency TP list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra-frequency TPs and additionally search for and identify new intra-frequency TPs.

8.11.3.1.1 Requirements

8.11.3.1.1.1 Requirements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency TP within $T_{identify_intra_TP_FS3}$.

Tidentify intra TP FS3 = Tidentify intra FS3 + Tmeasure intra FS3 CSI-RS,

where

T_{identify intra FS3} is the intra-frequency period for cell identification in Section 8.11.2.1.1.1,

T_{measure intra FS3 CSI-RS} is the intra-frequency period for TP measurement as shown in Table 8.11.3.1.1.1-1,

T_{DMTC_periodicity} is the discovery signal measurement timing configuration periodicity of higher layer,

M is the number of configured discovery signal occasions which are not available during $T_{measure_intra_FS3_CSI-RS}$ for the measurements at the UE due to the absence of the necessary radio signals.

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in Section 9.1.18.4 are fulfilled for a corresponding Band,
- SCH_RP is according to Annex B.2.12 for a corresponding Band and SCH Es/Iot is according to Section 8.11.2.1.1.1.

Identification of a TP shall include identification of the cell and additionally performing a single measurement on the TP within the measurement period of $T_{measure_intra_FS3_CSI-RS}$ when no DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure_intra_FS3_CSI-RS}$ as shown in table 8.11.3.1.1.1-1, when no DRX is in use. The UE shall be capable of performing CSI-RSRP measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_FS3_CSI-RS}$

Table 8.11.3.1.1.1-1: Intra-frequency TP measurement requirements under operation with frame structure 3

Measurement bandwidth [RB]	CSI-RS Es/lot	Discovery signal occasion duration (ds- OccasionDuration) [ms]	T _{measure_intra_FS3_CSI-RS} , [ms]
≥6	[0] ≤ CSI-RS Ês/lot	1	([3]+M) * T _{DMTC_periodicity}
≥6	[-6] ≤ CSI-RS Ês/lot < [0]	1	([5]+M) * T _{DMTC_periodicity}
≥25	[0] ≤ CSI-RS Ês/lot	1	([1]+M) * T _{DMTC_periodicity}
≥25	[-6] ≤ CSI-RS Ês/lot < [0]	1	([3]+M) * T _{DMTC_periodicity}

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in Section 9.1.18.4.

8.11.3.1.1.1 Measurement Reporting Requirements

8.11.3.1.1.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in Section 9.1.18.4.

8.11.3.1.1.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in Section 9.1.18.4.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in Section 8.11.3.1.1.1.3.

8.11.3.1.1.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in Section 9.1.18.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_TP_FS3}$ defined in Section 8.11.3.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_intra_TP_FS3}$ defined in Section 8.11.3.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_FS3_CSI-RS}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.11.3.1.1.2 Requirements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency TP within $T_{identify\ intra\ TP\ FS3\ DRX}$.

 $T_{identify\ intra\ TP\ FS3\ DRX} = T_{identify\ intra\ FS3\ DRX} + T_{measure\ intra\ FS3\ CSI-RS\ DRX},$

where:

 $T_{identify_intra_FS3_DRX}$ is the intra-frequency period for cell identification in Section 8.11.2.1.1.2.

 $T_{measure_intra_FS3_CSI-RS_DRX}$ is the intra-frequency period for TP measurement as shown in Table 8.11.3.1.1.2-1, where

 $T_{DMTC_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

M is the number of configured discovery signal occasions during ON DURATION and which are not available duting $T_{measure\ intra\ FS3\ CSI-RS\ DRX}$ for the measurements at the UE due to the absence of the necessary radio signals.

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in Section 9.1.18.4 are fulfilled for a corresponding Band,
- SCH_RP is according to Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Section 8.11.2.1.1.2.

Identification of a TP shall include identification of the cell and additionally performing a single measurement on the TP within measurement period of $T_{measure_intra_FS3_CSI-RS_DRX}$ when DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_FS3_CSI-RS_DRX}$ as shown in Table 8.11.3.1.1.2-1, when DRX is in use. The UE shall be capable of performing CSI-RSRP measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_FS3_CSI-RS_DRX}$.

Table 8.11.3.1.1.2-1: Intra-frequency TP measurement requirements under operation with frame structure 3

Measurement bandwidth [RB]	CSI-RS Ês/lot	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_intra_FS3_CSI-RS_DRX} , [ms]
≥6	[0] ≤ CSI-RS Ês/lot	1	([3]+M) * Max{ T _{DMTC_periodicity} , DRX cycle length }
≥6	[-6]≤ CSI-RS Ês/lot<[0]	1	([5]+M) * Max{ T _{DMTC_periodicity} , DRX cycle length }
≥25	[0] ≤ CSI-RS Ês/lot	1	([1]+M) * Max{ T _{DMTC_periodicity} , DRX cycle length }
≥25	[-6]≤ CSI-RS Ês/lot<[0]	1	([3]+M) * Max{ T _{DMTC_periodicity} , DRX cycle length }

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in Section 9.1.18.4.

8.11.3.1.1.2.1 Measurement Reporting Requirements

8.11.3.1.1.2.1.1 Periodic Reporting

Reported CSI-RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in Section 9.1.18.4.

8.11.3.1.1.2.1.2 Event-triggered Periodic Reporting

Reported CSI-RSRP measurements contained in event triggered periodic measurement reports shall meet the requirements in Section 9.1.18.4.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in Section 8.11.3.1.1.2.1.3.

8.11.3.1.1.2.1.3 Event Triggered Reporting

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in Section 9.1.18.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_intra_TP_FS3_DRX}$ defined in Section 8.11.3.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_intra_TP_FS3_DRX}$ defined in Section 8.11.3.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_FS3_CSI_RS_DRX}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.11.3.2 E-UTRAN inter-frequency measurements

Editor's note: requirements are TBD.

8.11.4 RSSI measurements

8.11.4.1 E-UTRAN intra-frequency measurements

NOTE: The requirements in this section are applicable only for measurements on SCC following the frame structure type 3 [16].

The UE physical layer shall be capable of performing the RSSI measurements [4] on one or more serving carriers operating under frame structure type 3 [16], if the carrier(s) are indicated by higher layers [2], and reporting the RSSI measurements to higher layers. The UE physical layer shall provide to higher layers a single RSSI sample for each OFDM symbol within each configured RSSI measurement duration [2] occurring with a configured RSSI measurement timing configuration periodicity [2]. The RSSI measurement period corresponds to max(reportInterval, rmtc-Period), where reportInterval and rmtc-Period [2] are configured for the RSSI measurement by higher layers.

The RSSI measurement performed and reported according to this section shall meet the RSSI measurement accuracy requirement in Section 9.1.18.5.2.

8.11.4.2 E-UTRAN inter-frequency measurements

The UE physical layer shall be capable of performing the RSSI measurements on one or more serving carriers, if the carrier(s) are indicated by higher layers [2], and reporting the RSSI measurements to higher layers.

Editor's note: Requirements are TBD.

8.12 Discovery Signal Measurements for E-UTRA Carrier Aggregation under Operation with Frame Structure 3

8.12.1 Introduction

This section contains requirements on UE capabilities for support of E-UTRA carrier aggregation.

Non configured frequencies may be measured with measurement gaps according to the requirements in Section 8.11.2.2 and Section 8.11.3.2.

The requirements in Section 8.12 shall apply for E-UTRA carrier aggregation of one FDD PCell or one TDD PCell and SCells one one or more SCCs, where all SCCs are following the frame structure type 3 [16].

8.12.2 CRS based discovery signal measurements for E-UTRA carrier aggregation

8.12.2.1 Introduction

The requirements in Section 8.12.2 shall apply for CRS based discovery signal measurements comprising RSRP and RSRQ measurements [4].

8.12.2.2 Measurements of a secondary component carrier

A secondary component carrier may be activated and deactivated by MAC-CE commands as specified in [17]. The applicable performance requirements depend on whether the SCell on the corresponding frequency is actived or deactivated.

8.12.2.3 Measurements of a secondary component carrier with active SCell

When the SCell is activated, measurement performance requirements for the frequency are those given in Section 8.11.2.1. If common DRX is in use, then the requirements for that secondary component carrier are given by the DRX requirements in Section 8.11.2.1.1.2, otherwise the non-DRX requirements are applicable. The applicable measurement accuracy requirements are in Section 9.1.19.

8.12.2.4 Measurements of a secondary component carrier with deactivated SCell

This section defines the measurement requirements of a secondary component carrier with deactivated SCell based on the parameter *measCycleSCell* defined in TS 36.331 [2].

8.12.2.4.1 E-UTRAN secondary component carrier measurements when no common DRX is used

When no DRX is in use the UE shall be able to identify a new detectable cell on a secondary component carrier within $T_{identify\ SCC\ FS3}$, according to the parameter measCycleSCell.

 $T_{identify_SCC_FS3} = T_{detect_SCC_FS3} + T_{measure_SCC_FS3_CRS}$

where:

T_{detect SCC FS3} is the time period for cell detection as specified in Table 8.12.2.4.1-1,

 $T_{measure_SCC_FS3_CRS}$ is the time period for measurements as shown in Table 8.12.2.4.1-2,

T_{DMTC periodicity} is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions which are not available during $T_{\text{detect_SCC_FS3}}$ for cell detection at the UE due to the absence of the necessary radio signals,

M is the number of configured discovery signal occasions which are not available during $T_{measure_SCC_FS3_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals.

Table 8.12.2.4.1-1: Intra-frequency cell detection on SCC under operation with frame structure 3 with deactivated SCell

SCH Ês/lot	T _{detect SCC_FS3} , [ms]
[0] ≤ SCH Ês/lot	([1]+L) * measCycleSCell
[-6] ≤ SCH Ês/lot < [0]	([5]+L) * measCycleSCell

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1.19 are fulfilled for a corresponding Band,
- $SCH_RP|_{dBm}$ is according to Annex B.2.12 for a corresponding Band and SCH $\hat{E}s/Iot$ is according to Table 8.12.2.4.1-1.

The measurement period for deactivated SCell measurements is $T_{measure_SCC_FS3_CRS}$ according to the parameter *measCycleSCell* shown in Table 8.12.2.4.1-1.

Table 8.12.2.4.1-2: Intra-frequency cell measurement requirements on SCC under operation with frame structure 3 with deactivated SCell

Measurement bandwidth [RB]	CRS Ês/lot	Discovery signal occasion duration (ds- OccasionDuration) [ms]	T _{measure_SCC_FS3_CRS} [ms]
≥6	[0] ≤ CRS Ês/lot	1	([3]+M) * measCycleSCell
≥6	[-6] ≤ CRS Ês/lot < [0]	1	([5]+M) * measCycleSCell
≥25	[0] ≤ CRS Ês/lot	1	([1]+M) * measCycleSCell
≥25	[-6] ≤ CRS Ês/lot < [0]	1	([3]+M) * measCycleSCell

The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{\text{measure SCC FS3 CRS}}$.

The measurement accuracy for all measured cells shall be as specified in Section 9.1.19.

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell that are specified in Section 7.8.

8.12.2.4.1.1 Measurement Reporting Requirements

8.12.2.4.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in Section 9.

8.12.2.4.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in Section 9.

The first report in event triggered periodic CRS based measurement reporting shall meet the requirements specified in Section 8.12.2.4.1.1.3.

8.12.2.4.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in Section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_SCC_FS3}$ defined in Section 8.12.2.4.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_SCC_FS3}$ defined in Section 8.12.2.4.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_SCC_FS3_CRS}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.12.2.4.2 E-UTRAN secondary component carrier measurements when common DRX is used

When DRX is in use the UE shall be able to identify a new detectable FS3 cell on a secondary component carrier within $T_{identify_SCC_FS3_DRX}$, according to the parameter measCycleSCell.

 $T_{identify_SCC_FS3_DRX} = T_{detect_SCC_FS3_DRX} + T_{measure_SCC_FS3_CRS_DRX},$

where:

T_{detect SCC FS3 DRX} is the time period for cell detection as shown in Table 8.12.2.4.2-1,

 $T_{measure_SCC_FS3_CRS_DRX}$ is the time period for measurements as shown in Table 8.12.2.4.2-2,

T_{DMTC} periodicity is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions during ON DURATION and which are not available during $T_{\text{detect_SCC_FS3_DRX}}$ for cell detection at the UE due to the absence of the necessary radio signals,

M is the number of configured discovery signal occasions during ON DURATION and which are not available during $T_{measure_SCC_FS3_CRS_DRX}$ for the measurements at the UE due to the absence of the necessary radio signals.

Table 8.12.2.4.2-1: Cell detection on SCC under operation with frame structure 3

SCH Ês/lot	T _{detect SCC_FS3_DRX} , [ms]
[0] ≤ SCH Ês/lot	(TBD+L) * Max{ measCycleSCell, DRX cycle
	length }
[-6] ≤ SCH Ês/lot < [0]	(TBD +L) * Max{ measCycleSCell, DRX cycle
	length }

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1.19 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} is according to Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.12.2.4.2-1.

The measurement period for deactivated scell measurements is $T_{measure_SCC_FS3_CRS_DRX}$ according to the parameter measCycleSCell shown in Table 8.12.2.4.2-2.

Table 8.12.2.4.2-2: Measurement requirements on SCC under operation with frame structure 3

Measurement bandwidth [RB]	CRS Ês/lot	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_} SCC_FS3_CRS_DRX, [ms]
≥6	[0] ≤ CRS Ês/lot	1	([3]+M) * Max{ measCycleSCell, DRX cycle length }
≥6	[-6] ≤ CRS Ês/lot < [0]	1	([5]+M) * Max{ measCycleSCell, DRX cycle length }
≥25	[0] ≤ CRS Ês/lot	1	([1]+M) * Max{ measCycleSCell, DRX cycle length }
≥25	[-6] ≤ CRS Ês/lot < [0]	1	([3]+M) * Max{ measCycleSCell, DRX cycle length }

The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_SCC_FS3_CRS_DRX}$.

The measurement accuracy for all measured cells shall be as specified in Section 9.1.19.

A UE may reconfigure receiver bandwidth taking into account the SCell activation/deactivation status, and when making measurements of cells on one or two SCCs with deactivated SCell. This may cause interruptions (packet drops) to a PCell or an activated SCell. No interruptions while the On Duration timer is running shall be allowed when common DRX is used. The requirement considers only interruptions due to reconfiguration of the receiver bandwidth, and not due to other causes such as RF impairments or channel conditions.

8.12.2.4.2.1 Measurement Reporting Requirements

8.12.2.4.2.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in Section 9

8.12.2.4.2.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in Section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in Section 8.12.2.4.2.1.3.

8.12.2.4.2.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in Section 9.

The UE shall not send any event triggered CRS based measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_SCC_FS3}$ defined in Section 8.12.2.4.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_SCC_FS3_DRX}$ defined in Section 8.12.2.4.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_SCC_FS3_CRS_DRX}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.12.3 Requirements for CSI-RS based discovery signal measurements for E-UTRA carrier aggregation

8.12.3.1 Introduction

The requirements in Section 8.12.3 shall apply for CSI-RS based discovery signal measurements comprising CSI-RSRP measurements [4].

8.12.3.2 Measurements of a secondary component carrier

A Secondary component carrier may be activated and deactivated by MAC-CE commands as specified in [17]. The applicable performance requirements depend on whether the SCell on the corresponding frequency is actived or deactivated.

8.12.3.3 Measurements of a secondary component carrier with active SCell

When the SCell is activated, measurement performance requirements for the frequency are those given in Section 8.11.3.1. If common DRX is in use, then the requirements for that secondary component carrier are given by the DRX requirements in Section 8.11.3.1.1.2, otherwise the non DRX requirements are applicable. The applicable measurement accuracy requirements are in Section 9.1.19.

8.12.3.4 Measurements of a secondary component carrier with deactivated SCell

This section defines the measurement requirements of a secondary component carrier with deactivated SCell based on the parameter *measCycleSCell* defined in TS 36.331 [2].

8.12.3.4.1 E-UTRAN secondary component carrier measurements when no common DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FS3 TP on a secondary component carrier within $T_{identify_SCC_TP_FS3}$, according to the parameter measCycleSCell.

 $T_{identify\ SCC\ TP\ FS3} = T_{identify\ SCC\ FS3} + T_{measure\ SCC\ FS3\ CSI-RS}$

where:

T_{identify SCC FS3} is the time period for cell identification in Section 8.12.2.4.1,

 $T_{measure_SCC_FS3_CSI-RS}$ is the time period for TP measurement in Table 8.12.3.4.1-1,

M is the number of configured discovery signal occasions which are not available for the measurements at the UE during $T_{measure_SCC_FS3_CSI-RS}$ due to the absence of the necessary radio signals.

Table 8.12.3.4.1-1: Measurement requirements for a TP on SCC under operation with frame structure 3

Measurement bandwidth [RB]	CSI-RS Ës/lot	Discovery signal occasion duration (ds- OccasionDuration) [ms]	T _{measure_SCC_FS3_CSI-RS} [ms]
≥6	[0] ≤ CSI-RS Ês/lot	1	([3]+M) * measCycleSCell
≥6	[-6] ≤ CSI-RS Ês/lot < [0]	1	([5]+M) * measCycleSCell
≥25	[0] ≤ CSI-RS Ês/lot	1	([1]+M) * measCycleSCell
≥25	[-6] ≤ CSI-RS Ês/lot < [0]	1	([3]+M) * measCycleSCell

A cell shall be considered detectable when

- CSI-RSRP related side condition given in Section 9.1.19 are fulfilled for a corresponding Band,
- $SCH_RP|_{dBm}$ is according to Annex B.2.12 for a corresponding Band and SCH $\hat{E}s/Iot$ is according to Table 8.12.2.4.1-1.

The UE shall be capable of performing RSRP measurements for 3 identified TPs on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\ SCC\ FS3\ CSI-RS}$.

The measurement accuracy for all measured TPs shall be as specified in Section 9.1.19.

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell that are specified in Section 7.8.

8.12.3.4.1.1 Measurement Reporting Requirements

8.12.3.4.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in Section 9.

8.12.3.4.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in Section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in Section 8.12.3.4.1.1.3.

8.12.3.4.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in Section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty

is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_SCC_TP_FS3}$ defined in Section 8.12.3.4.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_SCC_TP_FS3}$ defined in Section 8.12.3.4.1 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_SCC_FS3_CSI-RS}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.12.3.4.2 E-UTRAN secondary component carrier measurements when common DRX is used

When DRX is in use the UE shall be able to identify a new detectable FS3 TP on a secondary component carrier within $T_{identify_SCC_TP_FS3_DRX}$, according to the parameter *measCycleSCell*.

 $T_{identify_SCC_TP_FS3_DRX} = T_{identify_SCC_FS3_DRX} + T_{measure_SCC_FS3_CSI-RS_DRX},$

where:

T_{identify SCC FS3 DRX} is the time period for cell identification in Section 8.12.2.4.2,

 $T_{measure\ SCC\ FS3\ CSI-RS\ DRX}$ is the time period for TP measurement in Table 8.12.3.4.2-1,

M is the number of configured discovery signal occasions during ON DURATION and which are not available during $T_{measure_SCC_FS3_CSI-RS_DRX}$ for the measurements at the UE due to the absence of the necessary radio signals.

Table 8.12.3.4.2-1: Measurement requirements for a TP on SCC under operation with frame structure 3

Measurement bandwidth [RB]	CSI-RS Ês/lot	Discovery signal occasion duration (ds-OccasionDuration) [ms]	T _{measure_SCC_FS3_CSI-RS_DRX} , [ms]
≥6	[0] ≤ CSI-RS Ês/lot	1	([3]+M) * <i>Max</i> { <i>measCycleSCell</i> , DRX cycle length }
≥6	[-6] ≤ CSI-RS Ês/lot < [0]	1	([5]+M) * <i>Max</i> { <i>measCycleSCell</i> , DRX cycle length }
≥25	[0] ≤ CSI-RS Ês/lot	1	([1]+M) * Max{ measCycleSCell, DRX cycle length }
≥25	[-6] ≤ CSI-RS Ês/lot < [0]	1	([3]+M) * Max{ measCycleSCell, DRX cycle length }

A cell shall be considered detectable when

- CSI-RSRP related side condition given in Section 9.1.19 are fulfilled for a corresponding Band,
- $SCH_RP|_{dBm}$ is according to Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.12.2.4.2-1.

The UE shall be capable of performing CSI-RSRP measurements for 3 identified TPs on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{measure SCC FS3 CSI-RS DRX}}$.

The measurement accuracy for all measured TPs shall be as specified in Section 9.1.19.

A UE may reconfigure receiver bandwidth taking into account the SCell activation/deactivation status, and when making measurements of TPs on one or two SCCs with deactivated SCell. This may cause interruptions (packet drops) to a PCell or an activated SCell. No interruptions while the On Duration timer is running shall be allowed when common DRX is used. The requirement considers only interruptions due to reconfiguration of the receiver bandwidth, and not due to other causes such as RF impairments or channel conditions.

8.12.3.4.2.1 Measurement Reporting Requirements

8.12.3.4.2.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in Section 9.

8.12.3.4.2.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in Section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in Section 8.12.3.4.2.1.3.

8.12.3.4.2.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in Section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify_SCC_TP_FS3_DRX}$ defined in Section 8.12.3.4.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify_SCC_TP_FS3_DRX}$ defined in Section 8.12.3.4.2 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_SCC_FS3_CSI_RS_DRX}$ provided the timing to that TP has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.13 Measurements for UE Category M1

8.13.1 Introduction

The UE category M1 applicability of the requirements in subclause 8.13 is defined in Section 3.1.

This clause contains requirements on the UE regarding measurement reporting in RRC_CONNECTED state. The requirements are specified for E-UTRA intra frequency measurements. These measurements may be used by the E-UTRAN, e.g. for handover decisions. The measurement quantities are defined in [4], the measurement model is defined in [22] and measurement accuracies are specified in clause 9. Control of measurement reporting is specified in TS 36.331 [2].

When the UE is provided with IDC solution, the UE shall also perform RRM measurements and meet the corresponding requirements in clause 8.

8.13.2 Requirements for UE category M1 with CE mode A

The UE category M1 applicability of the requirements in subclause 8.13.2 is defined in Section 3.1. The requirements defined in clause 8.13.2 apply provided the following conditions are met:

- UE is configured with measurement gap according to any of gap patterns defined in Table 8.1.2.1-1.

8.13.2.1 E-UTRAN intra frequency measurements by UE category M1 with CE mode A

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

8.13.2.1.1 E-UTRAN FDD intra frequency measurements

8.13.2.1.1.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.13.2.1.1.1-1 when SCH \hat{E} s/Iot >= -6 dB

Table 8.13.2.1.1.1-1: Requirement on cell detection delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell detection delay (Tidentify_intra_UE cat M1)	Measurement delay (T _{Measurement_Period_UE} cat M1, Intra)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_UE\ cat\ M1\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.13.2.1.1.1-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurement of cells from UE physical layer to higher layers may be decreased.

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.1 and 9.1.21.2.

8.13.2.1.1.1.1 Measurement Reporting Requirements

8.13.2.1.1.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

8.13.2.1.1.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.2.1.1.1.3.

8.13.2.1.1.1.3 Event Triggered Reporting

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify\;intra_UE\;cat\;M1}$ defined in Clause 8.13.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.2.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than $\pm 50\ Ts$ and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.2.1.1.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra_UE\ cat}$ M_{II} as shown in table 8.13.2.1.1.2-1

Table 8.13.2.1.1.2-1: Requirement to identify a newly detectable FDD intrafrequency cell

DRX cycle length (s)	T _{identify_intra_UE cat M1} (s) (DRX cycles)		
≤0.04	[1] (Note1)		
0.04 <drx-cycle≤0.08< td=""><td>Note2 (40)</td></drx-cycle≤0.08<>	Note2 (40)		
0.128	3.2 (25)		
0.128 <drx-< td=""><td>Note2(20)</td></drx-<>	Note2(20)		
cycle≤2.56			
	Number of DRX cycle depends upon the DRX cycle in use		
_	Time depends upon the DRX cycle in		

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.12-1 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_UE\ cat\ M1}$ as shown in table 8.13.2.1.1.2-2. The UE shall be capable of performing RSRP measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_UE\ cat\ M1}$.

Table 8.13.2.1.1.2-2: Requirement to measure FDD intrafrequency cells

DRX cycle length (s)	T _{measure_intra_UE cat M1} (s) (DRX cycles)
≤0.08	0.4 (Note1)
0.08 <drx-cycle≤2.56< td=""><td>Note2 (5)</td></drx-cycle≤2.56<>	Note2 (5)
NOTE 1 Number of D the DRX cyc	RX cycle depends upon le in use
	ds upon the DRX cycle in

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.1 and 9.1.21.2.

8.13.2.1.1.2.1 Measurement Reporting Requirements

8.13.2.1.1.2.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

8.13.2.1.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.2.1.1.2.1.3.

8.13.2.1.1.2.1.3 Event Triggered Reporting

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times \text{TTI}_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra,\,UE\,cat\,M1}$ defined in Clause 8.13.2.1.1.2 When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_UE\ cat\ M1}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.2.1.2 E-UTRAN intra frequency measurements for HD-FDD

8.13.2.1.2.1 E-UTRAN intra frequency measurements when no DRX is used

The requirements in this section are applicable for the UE which supports half duplex operation on one or more supported frequency bands [2].

The requirements defined in clause 8.13.2.1.1.1 also apply for this section provided the following conditions are met:

- at least downlink subframe # 0 or downlink subframe # 5 per radio frame of an intra-frequency cell to be identified by the UE is available at the UE over T_{identify_intra_UE cat M1};
- at least one downlink subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell over $T_{\text{measure intra_UE cat M1}}$.
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-2 for a corresponding Band

8.13.2.1.2.2 E-UTRAN intra frequency measurements when DRX is used

The requirements in this section are applicable for the UE which supports half duplex operation on one or more supported frequency bands [2].

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra_UE\ cat}$ as shown in table 8.13.2.1.2.2-1

Table 8.13.2.1.2.2-1: Requirement to identify a newly detectable HD-FDD intrafrequency cell

DRX cycle length (s)	T _{identify_intra_UE} cat M1 (s) (DRX cycles)	
≤0.04	1 (Note1)	
0.04 <drx-cycle≤0.08< td=""><td>Note2 (50)</td></drx-cycle≤0.08<>	Note2 (50)	
0.128	3.2 (32)	
0.128 <drx-< td=""><td>Note2(25)</td></drx-<>	Note2(25)	
cycle≤2.56		
NOTE 1: Number of D	1: Number of DRX cycle depends upon the	
DRX cycle in use		
NOTE2: Time depend	Time depends upon the DRX cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-2 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_UE\ cat\ M1}$ as shown in table 8.13.2.1.2.2-2. The UE shall be capable of performing RSRP measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_UE\ cat\ M1}$.

Table 8.13.2.1.2.2-2: Requirement to measure HD-FDD intrafrequency cells

DRX cycle length (s)	T _{measure_intra_UE cat M1} (s) (DRX cycles)
≤0.04	0.4 (Note1)
0.04 <drx-cycle≤0.16< td=""><td>Note2 (7)</td></drx-cycle≤0.16<>	Note2 (7)
0.16 <drx-cycle≤2.56< td=""><td>Note2(5)</td></drx-cycle≤2.56<>	Note2(5)
NOTE 1: Number of DRX cycle depends upon the DRX cycle in use	
NOTE 2: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.1 and 9.1.21.2.

8.13.2.1.2.2.1 Measurement Reporting Requirements

8.13.2.1.2.2.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

8.13.2.1.2.2.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.2.1.2.2.1.3.

8.13.2.1.2.2.1.3 Event Triggered Reporting

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay

excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra_UE\ cat\ M1}$ defined in Clause 8.13.2.1.2.2 When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.2.1.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_UE\ cat\ M1}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.2.1.3 E-UTRAN TDD intra frequency measurements

8.13.2.1.3.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.13.2.1.3.1-1 when SCH $\hat{E}s/Iot >= -6 \text{ dB}$

Table 8.13.2.1.3.1-1: Requirement on cell detection delay and measurement delay for TDD intrafrequency cell

Gap pattern ID	Cell detection delay (Tidentify_intra_UE cat M1)	Measurement delay (T _{Measurement_Period_UE cat M1, Intra)}
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_UE\ cat\ M1\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.13.2.1.3.1-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.1 and 9.1.21.2.

8.13.2.1.3.1.1 Measurement Reporting Requirements

8.13.2.1.3.1.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

8.13.2.1.3.1.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.2.1.3.1.1.3.

8.13.2.1.3.1.1.3 Event Triggered Reporting

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify\;intra_UE\;cat\;M1}$ defined in Clause 8.13.2.1.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.2.1.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ Intra_UE\ cat\ M1}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.2.1.3.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra_LC\ UE}$ T_{Vppe2} as shown in table 8.13.2.1.3.2-1

Table 8.13.2.1.3.2-1: Requirement to identify a newly detectable TDD intrafrequency cell

DRX cyc	cle length (s)	T _{identify_intra_UE cat M1} (s) (DRX cycles)
	≤0.04	1 (Note1)
0.04 <dr< td=""><td>X-cycle≤0.08</td><td>Note2 (40)</td></dr<>	X-cycle≤0.08	Note2 (40)
(0.128	3.2 (25)
0.12	28 <drx-< td=""><td>Note2(20)</td></drx-<>	Note2(20)
cycle≤2.56		
Note1:	Number of DRX cycle depends upon the	
	DRX cycle in use	
Note2:	Time depends upon the DRX cycle in	
	use	

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-1 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_UE\ cat\ M1}$ as shown in table 8.13.2.1.3.2-2. The UE shall be capable of performing RSRP measurements for 6 identified intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_UE\ cat\ M1}$.

Table 8.13.2.1.3.2-2: Requirement to measure TDD intra frequency cells

DRX cycl	e length (s)	T _{measure_intra_UE cat M1} (s) (DRX cycles)
≤	0.08	0.4 (Note1)
0.08 <dr< td=""><td>K-cycle≤2.56</td><td>Note2 (5)</td></dr<>	K-cycle≤2.56	Note2 (5)
NOTE 1:	Number of DRX cycle depends upon the DRX cycle in use.	
NOTE 2:	Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.1 and 9.1.21.2.

8.13.2.1.3.2.1 Measurement Reporting Requirements

8.13.2.1.3.2.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

8.13.2.1.3.2.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.2.1.3.2.1.3.

8.13.2.1.3.2.1.3 Event Triggered Reporting

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra_UE\ cat\ M1}$ defined in Clause 8.13.2.1.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.2.1.3.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_UE\ cat\ M1}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.2.2 E-UTRAN E-CID Measurements Requirements for UE category M1 with CE mode A

8.13.2.2.1 E-UTRAN FDD Intra-frequency E-CID RSRP Measurements

8.13.2.2.1.1 Introduction

The requirements in section 8.13.2.2.1 shall apply provided the UE has received ECID-RequestLocationInformation message from E-SMLC via LPP requesting the UE to report E-CID E-UTRAN FDD intra-frequency RSRP measurements [24].

8.13.2.2.1.2 Measurement Requirements

The requirements in section 8.13.2.1.1 also apply for this section except the measurement reporting requirements. The measurement reporting requirements for E-CID RSRP are defined in section 8.13.2.2.1.3.

8.13.2.2.1.3 Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.1.17.1 and 9.1.17.2 respectively.

8.13.2.2.2 E-UTRAN HD-FDD Intra-frequency E-CID RSRP Measurements

8.13.2.2.2.1 Introduction

The requirements in this section are applicable for the UE which supports half duplex operation on one or more supported frequency bands [2].

The requirements defined in clause 8.13.2.2.1.1 also apply for this section provided the following conditions are met:

- at least downlink subframe # 0 and downlink subframe # 5 per radio frame of an intra-frequency cell to be identified by the UE is available at the UE over T_{identify_intra_UE cat M1};
- at least two consecutive downlink subframe per radio frame of measured cell is available at the UE for RSRP measurements assuming measured cell is identified cell over $T_{measure_intra_UE\ cat\ M1}$.
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-4

8.13.2.2.2.2 Measurement Requirements

The requirements in section 8.13.2.1.2 also apply for this section except the measurement reporting requirements. The measurement reporting requirements for E-CID RSRP are defined in section 8.13.2.2.2.3.

8.13.2.2.2.3 Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.1.17.1 and 9.1.17.2 respectively.

8.13.2.2.3 E-UTRAN TDD Intra-frequency E-CID RSRP Measurements

8.13.2.2.3.1 Introduction

The requirements in section 8.13.2.2.3 shall apply provided the UE has received ECID-RequestLocationInformation message from E-SMLC via LPP requesting the UE to report E-CID E-UTRAN TDD intra-frequency RSRP measurements [24].

8.13.2.2.3.2 Measurement Requirements

The requirements in section 8.13.2.1.3 also apply for this section except the measurement reporting requirements. The measurement reporting requirements for E-CID RSRP are defined in section 8.13.2.2.3.3.

8.13.2.2.3.3 Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.1.17.1 and 9.1.17.2 respectively.

8.13.3 Requirements for UE category M1 with CE mode B

The UE category M1 applicability of the requirements in subclause 8.13.3 is defined in Section 3.1. The requirements defined in clause 8.13.3 apply provided the following conditions are met:

- UE is configured with measurement gap according to any of gap patterns defined in Table 8.1.2.1-1.

8.13.3.1 E-UTRAN intra frequency measurements by UE category M1 with CE mode B

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

8.13.3.1.1 E-UTRAN FDD intra frequency measurements

8.13.3.1.1.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.13.3.1.1.1-1 when SCH $\hat{E}s/Iot >= -15 \text{ dB}$

Table 8.13.3.1.1.1-1: Requirement on cell detection delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell detection delay (Tidentify_intra_UE cat M1)	Measurement delay (T _{Measurement_Period_UE cat M1, Intra)}
0	As specified in Table 8.13.3.1.1.1-2	800 ms
1	As specified in Table 8.13.3.1.1.1-2	800 ms

Table 8.13.3.1.1.1-2: Requirement on cell detection delay and measurement delay for FDD intrafrequency cell

SCH Ês/lot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/lot: Q2	T _{basic_identify_E-UTRA_FDD_UE} cat M1, intra (S)
-15≤Q1<-6	-15≤ Q2 < -6	320.8
-15≤Q1<-6	Q2≥-6	Requirements in 8.13.2 apply
Q1≥ -6	Q2≥-6	Requirements in 8.13.2 apply

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_UE\ cat\ M1\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.13.3.1.1.1-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.3 and 9.1.21.4.

8.13.3.1.1.1.1 Measurement Reporting Requirements

8.13.3.1.1.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1. 17.3 and 9.1.21.4.

8.13.3.1.1.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.3.1.1.1.3.

8.13.3.1.1.1.3 Event Triggered Reporting

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify\;intra_UE\;cat\;M1}$ defined in Clause 8.13.3.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.3.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.3.1.1.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra_UE\ cat}$ M1 as shown in table 8.13.3.1.1.2-1

Table 8.13.3.1.1.2-1: Requirement to identify a newly detectable FDD intrafrequency cell

DRX o	cycle length (s)	T _{identify_intra_UE cat M1} (s) (DRX cycles)
DRX-cycle ≤ 0.640 [320.8] (Note1)		[320.8] (Note1)
1.28 <drx-cycle≤2.56< td=""><td>Note2(400)</td></drx-cycle≤2.56<>		Note2(400)
Note1:	Number of DRX cycle depends upon the	
DRX cycle in use		
Note2:	Time depends upon the DRX cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-3 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_UE\ cat\ M1}$ as shown in table 8.13.3.1.1.2-2. The UE shall be capable of performing RSRP measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_UE\ cat\ M1}$.

Table 8.13.3.1.1.2-2: Requirement to measure FDD intrafrequency cells

DRX cycl	_	T _{measure_intra_UE cat M1} (s) (DRX cycles)
≤0.	08	0.8 (Note1)
0.08<	DRX-	Note2 (5)
cycles	≤2.56	
Note1:	Number of DRX cycle depends upon	
	the DRX cycle in use	
Note2:	Time depends upon the DRX cycle in	
	use	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.3 and 9.1.21.4.

8.13.3.1.1.2.1 Measurement Reporting Requirements

8.13.3.1.1.2.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

8.13.3.1.1.2.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.3.1.1.2.1.3.

8.13.3.1.1.2.1.3 Event Triggered Reporting

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra,\,UE\,cat\,M1}$ defined in Clause 8.13.3.1.1.2 When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.3.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_UE\ cat\ M1}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.3.1.2 E-UTRAN intra frequency measurements for HD-FDD

8.13.3.1.2.1 E-UTRAN intra frequency measurements when no DRX is used

The requirements in this section are applicable for the UE which supports half duplex operation on one or more supported frequency bands [2].

The requirements defined in clause 8.13.3.1.1.1 also apply for this section provided the following conditions are met:

- at least downlink subframe # 0 and downlink subframe # 5 per radio frame of an intra-frequency cell to be identified by the UE is available at the UE over T_{identify_intra_UE cat M1};
- at least two consecutive downlink subframe per radio frame of measured cell is available at the UE for RSRP measurements assuming measured cell is identified cell over $T_{measure_intra_UE\ cat\ M1}$.
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-4

8.13.3.1.2.2 E-UTRAN intra frequency measurements when DRX is used

The requirements in this section are applicable for the UE which supports half duplex operation on one or more supported frequency bands [2].

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra_UE\ cat}$ as shown in table 8.13.3.1.2.2-1

Table 8.13.3.1.2.2-1: Requirement to identify a newly detectable HD-FDD intrafrequency cell

DRX	ycle length (s)	T _{identify_intra_UE cat M1} (s) (DRX cycles)
DRX	-cycle ≤ 0.640	[320.8] (Note1)
1.28 <drx-cycle≤2.56< td=""><td>Note2(400)</td></drx-cycle≤2.56<>		Note2(400)
Note1:	Number of DRX cycle depends upon the	
DRX cycle in use		
Note2:	Time depends up	on the DRX cycle in use

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-4 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_UE\ cat\ M1}$ as shown in table 8.13.3.1.2.2-2. The UE shall be capable of performing RSRP measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra\ UE\ cat\ M1}$.

Table 8.13.3.1.2.2-2: Requirement to measure HD-FDD intrafrequency cells

DRX cy	cle length (s)	T _{measure_intra_UE cat M1} (s) (DRX cycles)
≤	0.04	0.8 (Note1)
0.04	<drx-< td=""><td>Note2 (7)</td></drx-<>	Note2 (7)
cycl	e≤0.16	
0.16	<drx-< td=""><td>Note2(5)</td></drx-<>	Note2(5)
cycl	e≤2.56	
Note1:		DRX cycle depends upon
	the DRX cy	
Note2:	Time deper	nds upon the DRX cycle in
	use	

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.3 and 9.1.21.4.

8.13.3.1.2.2.1 Measurement Reporting Requirements

8.13.3.1.2.2.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

8.13.3.1.2.2.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.3.1.2.2.1.3.

8.13.3.1.2.2.1.3 Event Triggered Reporting

Reported RSRP measurements contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra_UE\ cat\ M1}$ defined in Clause 8.13.3.1.2.2 When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.3.1.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_UE\ cat\ M1}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.3.1.3 E-UTRAN TDD intra frequency measurements

8.13.3.1.3.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.13.3.1.3.1-1when SCH $\hat{E}s/Iot >= -15$ dB

Table 8.13.3.1.3.1-1: Requirement on cell detection delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell detection delay (Tidentify_intra_UE cat M1)	Measurement delay (T _{Measurement_Period_UE} cat M1, Intra)
0	As specified in Table 8.13.3.1.3.1-2	800 ms
1	As specified in Table 8.13.3.1.3.1-2	800 ms

Table 8.13.3.1.3.1-2: Requirement on cell detection delay and measurement delay for FDD intrafrequency cell

SCH Ês/lot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/lot: Q2	T _{basic_identify_E-UTRA_FDD_UE} cat M1, intra (S)	
-15≤Q1<-6	-15≤ Q2 < -6	320.8	
-15≤Q1<-6	Q2≥-6	Requirements in 8.13.2 apply	
Q1≥ -6	Q2≥-6	Requirements in 8.13.2 apply	

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_UE\ cat\ M1\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.13.3.1.3.1-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.3 and 9.1.21.4.

8.13.3.1.3.1.1 Measurement Reporting Requirements

8.13.3.1.3.1.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

8.13.3.1.3.1.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.3.1.3.1.3.

8.13.3.1.3.1.1.3 Event Triggered Reporting

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify\;intra_UE\;cat\;M1}$ defined in Clause 8.13.3.1.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.3.1.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ Intra_UE\ cat\ M1}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.3.1.3.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra_LC\ UE}$ T_{Vppe2} as shown in table 8.13.3.1.3.2-1

Table 8.13.3.1.3.2-1: Requirement to identify a newly detectable TDD intrafrequency cell

DRX c	cycle length (s)	T _{identify_intra_UE cat M1} (s) (DRX cycles)
DRX	-cycle ≤ 0.640	[320.8] (Note1)
1.28<[ORX-cycle≤2.56	Note2(400)
Note1:	Number of DRX of DRX cycle in use	cycle depends upon the
Note2:	Time depends up	on the DRX cycle in use

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-3 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_UE\ cat\ M1}$ as shown in table 8.13.3.1.3.2-2. The UE shall be capable of performing RSRP measurement for 6 identified intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_intra_UE\ cat\ M1}$.

Table 8.13.3.1.3.2-2: Requirement to measure TDD intra frequency cells

DRX cy	cle length (s)	T _{measure_intra_UE cat M1} (s) (DRX cycles)	
≤(0.08	0.8 (Note1)	
0.08	<drx-< td=""><td>Note2 (5)</td></drx-<>	Note2 (5)	
cycle	e≤2.56		
Note1:	Number of DRX cycle depends upon the DRX cycle in use.		
Note2:	•		

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.3 and 9.1.21.4.

8.13.3.1.3.2.1 Measurement Reporting Requirements

8.13.3.1.3.2.1.1 Periodic Reporting

Reported RSRP measurement contained in periodically triggered measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

8.13.3.1.3.2.1.2 Event-triggered Periodic Reporting

Reported RSRP measurement contained in event triggered periodic measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 8.13.3.1.3.2.1.3.

8.13.3.1.3.2.1.3 Event Triggered Reporting

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in sections 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times \text{TTI}_{DCCH}$. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T $_{identify_intra_UE\ cat\ M1}$ defined in Clause 8.13.3.1.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra_UE\ cat\ M1}$ defined in clause 8.13.3.1.3.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra_UE\ cat\ M1}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

8.13.3.1.4 E-UTRAN FDD intra frequency measurements with autonomous gaps for UE category M1 with CE mode B

The requirements defined in this subclause 8.13.3.1.4 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1bis are supported in the target cell to be detected.

8.13.3.1.4.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify_CGI_Cat M1, intra}} = T_{\text{basic_identify_CGI_Cat M1, intra}}$$
 ms

Where

 $T_{basic_identify_CGI_Cat\ M1,\ intra} = 190\ ms.$ This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.12 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI_Cat\ M1,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [2] are used.

Within the time, $T_{identify_CGI_Cat\ M1,intra}\ ms$, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least the number of ACK/NACKs stated in Table 8.13.3.1.4.1-1on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.13.3.1.4.1-1: Condition for requirement on minimum number of ACK/NACKs to transmit during T_{basic_identify_CGI_Cat M1, intra}.

	Serving cell	Tar	get cell
SNR [dB]	Minimum ACK/NACK requirement	MIB repetition level	SIB1bis repetition level
≥ -6	TBD	4	TBD
< -6	N/A	4	TBD

8.13.3.1.4.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.13.3.1.5 E-UTRAN intra frequency measurements with autonomous gaps for HD-FDD UE category M1 with CE mode B

The requirements in this section are applicable for the UE which supports half duplex FDD operation on one or more supported frequency bands [2].

The requirements defined in this subclause 8.13.3.1.5 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1bis are supported in the target cell to be detected.

8.13.3.1.5.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

All the CGI requirements with the exception of requirement on the number of ACK/NACK transmission on PCell defined in clause 8.13.3.1.4.1 also apply for this section.

For the UE supporting half duplex FDD operation there is no requirement in terms of number of ACK/NACK transmission on PCell.

8.13.3.1.5.2 ECGI Reporting Delay

The ECGI reporting delay defined in clause 8.13.3.1.5.2 also apply for this section

8.13.3.1.6 E-UTRAN TDD intra frequency measurements with autonomous gaps for UE category M1 with CE mode B

The requirements defined in this subclause 8.13.3.1.6 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1bis are supported in the target cell to be detected.

8.13.3.1.6.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify_CGI_Cat M1, intra}} = T_{\text{basic_identify_CGI_Cat M1, intra}}$$
 ms

Where

 $T_{basic_identify_CGI_Cat\ M1,\ intra} = 190\ ms.$ This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.12 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI_Cat\ M1,\ intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [2] are used.

Within the time, $T_{\text{identify_CGI_Cat M1, intra}}$ ms , over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs as stated in Table 8.13.3.1.6.1-2 on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).
- and condition in Table 8.13.3.1.6.1-1 are met.

Table 8.13.3.1.6.1-1: Condition for requirement on minimum number of ACK/NACKs to transmit during T_{basic_identify_CGI_Cat M1, intra}.

	Serving cell	Tar	get cell
SNR [dB]	Minimum ACK/NACK requirement	MIB repetition level	SIB1bis repetition level
≥ -6	As stated in Table 8.13.3.1.6.1-2	4	TBD
< -6	N/A	4	TBD

Table 8.13.3.1.6.1-2: Requirement on minimum number of ACK/NACKs to transmit during

T_{basic_identify_CGI_Cat M1, intra-}

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0	TBD
1	TBD
2	TBD
3	TBD
4	TBD
5	TBD
6	TBD

8.13.3.1.6.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

8.13.3.2 E-UTRAN E-CID Measurements Requirements for UE category M1 with CE mode B

8.13.3.2.1 E-UTRAN FDD Intra-frequency E-CID RSRP Measurements

8.13.3.2.1.1 Introduction

The requirements in section 8.13.3.2.1 shall apply provided the UE has received ECID-RequestLocationInformation message from E-SMLC via LPP requesting the UE to report E-CID E-UTRAN FDD intra-frequency RSRP measurements [24].

8.13.3.2.1.2 Measurement Requirements

The requirements in section 8.13.3.1.1 also apply for this section except the measurement reporting requirements. The measurement reporting requirements for E-CID RSRP are defined in section 8.13.3.2.1.3.

8.13.3.2.1.3 Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.1.17.3 and 9.1.17.4 respectively.

8.13.3.2.2 E-UTRAN HD-FDD Intra-frequency E-CID RSRP Measurements

8.13.3.2.2.1 Introduction

The requirements in this section are applicable for the UE which supports half duplex operation on one or more supported frequency bands [2].

The requirements defined in clause 8.13.3.2.1.1 also apply for this section provided the following conditions are met:

- at least downlink subframe # 0 and downlink subframe # 5 per radio frame of an intra-frequency cell to be identified by the UE is available at the UE over T_{identify_intra_UE cat M1};
- at least two consecutive downlink subframe per radio frame of measured cell is available at the UE for RSRP measurements assuming measured cell is identified cell over T_{measure intra UE cat M1}.
- SCH_RP and SCH Ês/Iot according to Annex Table B.2.12-4

8.13.3.2.2.2 Measurement Requirements

The requirements in section 8.13.3.1.2 also apply for this section except the measurement reporting requirements. The measurement reporting requirements for E-CID RSRP are defined in section 8.13.3.2.2.3.

8.13.3.2.2.3 Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.1.17.3 and 9.1.17.4 respectively.

8.13.3.2.3 E-UTRAN TDD Intra-frequency E-CID RSRP Measurements

8.13.3.2.3.1 Introduction

The requirements in section 8.13.3.2.3 shall apply provided the UE has received ECID-RequestLocationInformation message from E-SMLC via LPP requesting the UE to report E-CID E-UTRAN TDD intra-frequency RSRP measurements [24].

8.13.3.2.3.2 Measurement Requirements

The requirements in section 8.13.3.1.3 also apply for this section except the measurement reporting requirements. The measurement reporting requirements for E-CID RSRP are defined in section 8.13.3.2.3.3.

8.13.3.2.3.3 Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.1.17.3 and 9.1.17.4 respectively.

9 Measurements performance requirements for UE

One of the key services provided by the physical layer is the measurements used to trigger or perform a multitude of functions. Both the UE and the E-UTRAN are required to perform measurements. The physical layer measurement model and a complete list of measurements are specified in [25] and [22] respectively. The physical layer measurements

are described and defined in [4]. In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

Since the UE reference sensitivity requirements are different depending on supported band, this is noted in each case with definition of the range Io for each frequency band. Definitions of each frequency bands can be found in [5].

Except for requirements in sections 9.1.2A, 9.1.3A, 9.1.5A and 9.1.6A, the accuracy requirements in this clause are applicable for AWGN radio propagation conditions and assume independent interference (noise) at each receiver antenna port.

9.1 E-UTRAN measurements

9.1.1 Introduction

The requirements in this clause are applicable for a UE:

- in state RRC CONNECTED
- performing measurements with appropriate measurement gaps as defined in Clause 8.1.2.1.
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in [25].

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the higher layer filtering disabled.

In the requirements of Section 9 for the UE capable of CA and the UEs configured with up to four downlink SCell(s), the applicable exceptions for side conditions are specified in Annex B, Sections B.4.2 and B.4.3, respectively.

9.1.2 Intra-frequency RSRP Accuracy Requirements

9.1.2.1 Absolute RSRP Accuracy

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.2.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band

Table 9.1.2.1-1: RSRP Intra frequency absolute accuracy

Accı	Accuracy Conditions						
Normal	Extreme	_	lo Note 1 range				
condition condition		Ês/lot	E-UTRA operating band groups ^{Note 3}	Minimum Io		Maximum Io	
dB	dB dB		dB		dBm/BW _{Channel}	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	N/A	-70	
		≥-6 dB	FDD_B	-120.5	N/A	-70	
			FDD_C, TDD_C	-120	N/A	-70	
			FDD_D	-119.5	N/A	-70	
±4.5	±9		FDD_E, TDD_E	-119	N/A	-70	
			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_H	-117.5	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.2.2 Relative Accuracy of RSRP

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.2.2-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2|_{dBm} according to Annex B.3.8 for a corresponding Band.

Table 9.1.2.2-1: RSRP Intra frequency relative accuracy

Accı	ıracy	Conditions			
Normal Extreme		Ês/lot Note	Io Note 1 range		
condition	condition	2	E-UTRA operating band groups ^{Note 5}	Minimum Io	Maximum lo
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}
			FDD_A, TDD_A	-121	-50
		≥-3 dB	FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
±2	±3		FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.1.2.3 Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction

The requirements for absolute accuracy of RSRP in this clause shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRP measurements on this cell is configured by higher layers (TS 36.331 [2]).

The accuracy requirements in Table 9.1.2.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled,

RSRP_{dBm} according to Annex B.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.2.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accı	Accuracy Conditions					
Normal	Extreme	_	lo Note 2 range			
condition condition		Ês/lot	E-UTRA operating band groups ^{Note 4}	Minimum Io		Maximum Io
dB	dB dB			m dBm/ 15kHz Note 1, 3	dBm/BW _{Channel}	dBm/BW _{Channel}
			FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
) ≥-4 dB	FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
±4.5	±9		FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum lo condition is expressed as the average lo per RE over all REs in that symbol.

NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The lo range defined by the minimum and the maximum lo levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.

NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

For time domain measurements restriction under colliding CRS with ABS configured in non-MBSFN subframes, requirements in Section 9.1.2.1 apply.

9.1.2.4 Relative Accuracy of RSRP under Time Domain Measurement Resource Restriction

The requirements for relative accuracy of RSRP in this clause shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRP measurements for this cell is configured by higher layers (TS 36.331 [2]).

The accuracy requirements in Table 9.1.2.4-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled,

RSRP1,2|_{dBm} according to Annex B.3.10 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.2.4-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accı	Accuracy		Conditions				
Normal	Extreme	Ês/lot Note	lo ^{Note 3} range				
condition	condition	2	E-UTRA operating band groups ^{Note 6}	Minimum Io	Maximum Io		
dB	dB	dB		dBm/ 15kHz Note 1, 5	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	-50		
			FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±2	±3	≥-2 dB	FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±3	±3	≥-4 dB	Note 4	Note 4	Note 4		

- NOTE 1: This minimum lo condition is expressed as the average lo per RE over all REs in that symbol.
- NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.
- NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
- NOTE 4: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

For time domain measurements restriction under colliding CRS with ABS configured in non-MBSFN subframes, requirements in Section 9.1.2.2 apply.

9.1.2.5 Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with CRS assistance information

The requirements for absolute accuracy of RSRP in this clause shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRP measurements on this cell is configured by higher layers (TS 36.331 [2]) and the CRS assistance information is provided. The requirements apply for UEs supporting CRS interference handling.

The accuracy requirements in Table 9.1.2.5-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in 36.101 Secion 7.3 for reference sensitivity are fulfilled,

RSRP_{dBm} according to Annex B.3.11 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern,

The UE is provided with the CRS assistance information (TS 36.331 [2]) and the CRS assistance information is valid throughout the entire evaluation period.

The requirements in this section shall also be met when the number of transmit antenna ports [16] of one or more cells whose CRS assistance information is provided [2] is different from the number of transmit antenna ports of the measured cell.

Table 9.1.2.5-1: RSRP Intra frequency absolute accuracy under Time Domain Measurement Resource
Restriction with CRS assistance information

Accı	Accuracy Conditions						
Normal	Extreme		lo Note 2 range				
condition	condition	Ês/lot	E-UTRA operating band groups ^{Note 4}		Minimum Io		
dB	dB	dB		dBm/15kHz Note	dBm/BW _{Channel}	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	N/A	-70	
			FDD_B	-120.5	N/A	-70	
			FDD_C, TDD_C	-120	N/A	-70	
		≥-9.46	FDD_D	-119.5	N/A	-70	
±4.5	±9		FDD_E, TDD_E	-119	N/A	-70	
			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_H	-117.5	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±8	±11	≥-9.46	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50	

- NOTE 1: This lo condition is expressed as the average lo per RE over all REs in an OFDM symbol.
- NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The specified lo range applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
- NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.2.6 Relative Accuracy of RSRP under Time Domain Measurement Resource Restriction with CRS assistance information

The requirements for relative accuracy of RSRP in this clause shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRP measurements for this cell is configured by higher layers (TS 36.331 [2]) and the CRS assistance information is provided. The requirements apply for UEs supporting CRS interference handling.

The accuracy requirements in Table 9.1.2.6-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled,

RSRP1,2|dBm according to Annex B.3.12 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern,

The UE is provided with the CRS assistance information (TS 36.331 [2]) and the CRS assistance information is valid throughout the entire evaluation period.

The requirements in this section shall also be met also when the number of transmit antenna ports [16] of one or more cells whose CRS assistance information is provided [2] is different from the number of transmit antenna ports of the measured cell.

Table 9.1.2.6-1: RSRP Intra frequency relative accuracy under Time Domain Measurement Resource
Restriction with CRS assistance information

Accuracy			Conditions				
Normal	Evtrome	Ĉo/lo₄ Note	lo	o ^{Note 3} range			
Normal Extreme condition		Ês/lot Note	E-UTRA operating band groups Note 7	Minimum Io	Maximum Io		
dB	dB	dB	-	dBm/15kHz Note 1, 5	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	-50		
			FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±2	±3	≥-6.96	FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±3	±3	≥-9.46	Note 4	Note 4	Note 4		

- NOTE 1: This lo condition is expressed as the average lo per RE over all REs in an OFDM symbol.
- NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.
- NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The specified Io range applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
- NOTE 4: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 6: The gap between the Es/lot level in table 9.1.2.6-1 and 9.1.2.4-1 is due to the interference from either PCell or at least one neighbour cell indicated within the CRS assistance information.
- NOTE 7: E-UTRA operating band groups are as defined in Section 3.5.

9.1.2A Intra-frequency RSRP Accuracy Requirements in High Doppler Conditions

The accuracy requirements in this clause are applicable for [EVA300 and EVA600] propagation conditions and assume independent interference (noise) at each receiver antenna port.

9.1.2A.1 Absolute RSRP Accuracy in high Doppler conditions

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.2A.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band

Table 9.1.2A1-1: RSRP Intra frequency absolute accuracy

Accı	ıracy		Conditions						
Normal	Extreme	Ês/lot	lo ^{Note 1} range						
condition			E-UTRA operating band groups Note 3	Minin	num lo	Maximum lo			
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}			
			FDD_A, TDD_A	-121	N/A	-70			
			FDD_B	-120.5	N/A	-70			
			FDD_C, TDD_C	-120	N/A	-70			
		5 ≥-6 dB	FDD_D	-119.5	N/A	-70			
±6	±10.5		FDD_E, TDD_E	-119	N/A	-70			
			FDD_F	-118.5	N/A	-70			
			FDD_G	-118	N/A	-70			
			FDD_H	-117.5	N/A	-70			
			FDD_N	-114.5	N/A	-70			
±9.5	±12.5	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50			

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.2A.2 Relative Accuracy of RSRP in high Doppler conditions

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.2A.2-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2|_{dBm} according to Annex B.3.8 for a corresponding Band.

Table 9.1.2A.2-1: RSRP Intra frequency relative accuracy

Accı	Accuracy		Conditions			
Marmal	Evtromo	Ês/lot Note	Io Note 1 range			
condition	Normal Extreme condition		E-UTRA operating band groups Note 5	Minimum Io	Maximum lo	
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	-50	
			FDD_B	-120.5	-50	
			FDD_C, TDD_C	-120	-50	
			FDD_D	-119.5	-50	
±3.3	±4.3	4.3 ≥-3 dB	FDD_E, TDD_E	-119	-50	
			FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
			FDD_N	-114.5	-50	
±4.3	±4.3	≥-6 dB	Note 3	Note 3	Note 3	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.1.3 Inter-frequency RSRP Accuracy Requirements

9.1.3.1 Absolute RSRP Accuracy

The requirements for absolute accuracy of RSRP in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.3.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.3 for a corresponding Band

Table 9.1.3.1-1: RSRP Inter frequency absolute accuracy

Accı	ıracy		C	Conditions			
Normal	Extreme	me Ês/lot	lo Note 1 range				
condition			E-UTRA operating band groups Note 3	Minim	um lo	Maximum lo	
dB	dB	dB		dBm/15kHz Note	dBm/BW _{Channel}	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	N/A	-70	
			FDD_B	-120.5	N/A	-70	
			FDD_C, TDD_C	-120	N/A	-70	
			FDD_D	-119.5	N/A	-70	
±4.5	±9	≥-6 dB	FDD_E, TDD_E	-119	N/A	-70	
			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_H	-117.5	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50	

NOTE 1: lo is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.3.2 Relative Accuracy of RSRP

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.3.2-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

 $RSRP1,2|_{dBm}$ according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1 \right|_{dBm} - RSRP2 \Big|_{dBm} \right| \le 27 dB$$

| Channel 1_Io -Channel 2_Io | \leq 20 dB

Table 9.1.3.2-1: RSRP Inter frequency relative accuracy

Accı	Accuracy		Condition		
Normal	Normal Extreme condition		lo ^{No}	range	
			E-UTRA operating band groups Note 4	Minimum Io	Maximum lo
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}
			FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
±4.5	±6	≥-6 dB	FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.

NOTE 3: The condition level is increased by ∆>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.3A Inter-frequency RSRP Accuracy Requirements in High Doppler Conditions

The accuracy requirements in this clause are applicable for [EVA300 and EVA600] propagation conditions and assume independent interference (noise) at each receiver antenna port.

9.1.3A.1 Absolute RSRP Accuracy in high Doppler conditions

The requirements for absolute accuracy of RSRP in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.3A.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.3 for a corresponding Band

Table 9.1.3A.1-1: RSRP Inter frequency absolute accuracy

Accı	ıracy		C	Conditions			
Normal	Extreme		lo Note 1 range				
condition	condition	Ês/lot	E-UTRA operating band groups Note 3	Minimum Io		Maximum lo	
dB	dB	dB	<u> </u>	dBm/15kHz Note	dBm/BW _{Channel}	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	N/A	-70	
			FDD_B	-120.5	N/A	-70	
			FDD_C, TDD_C	-120	N/A	-70	
			FDD_D	-119.5	N/A	-70	
±6	±10.5	≥-6 dB	FDD_E, TDD_E	-119	N/A	-70	
			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_H	-117.5	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±9.5	±12.5	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50	

NOTE 1: lo is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.3A.2 Relative Accuracy of RSRP in high Doppler conditions

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.3A.2-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2|dBm according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1 \right|_{dBm} - RSRP2 \Big|_{dBm} \right| \le 27 dB$$

| Channel 1_Io -Channel 2_Io | \leq 20 dB

Table 9.1.3A.2-1: RSRP Inter frequency relative accuracy

Accı	Accuracy		Conditions				
Normal	Extreme	Ês/lot Note	≘o/lot Note lo Note 1 range				
condition	condition	2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io		
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	-50		
			FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±5.8	±7.3	≥-6 dB	FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.

NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.4 RSRP Measurement Report Mapping

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.4-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.4-1: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
•••		
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

9.1.5 Intra-frequency RSRQ Accuracy Requirements

9.1.5.1 Absolute RSRQ Accuracy

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.5.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band

Table 9.1.5.1-1: RSRQ Intra frequency absolute accuracy

Accı	Accuracy		Conditio			
Normal	Extreme		lo Note 1 range			
condition	condition	Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum lo	
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	-50	
	±4		FDD_B	-120.5	-50	
			FDD_C, TDD_C	-120	-50	
			FDD_D	-119.5	-50	
±2.5		≥-3 dB	FDD_E, TDD_E	-119	-50	
			FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
			FDD_N	-114.5	-50	
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.5.2 Absolute RSRQ Accuracy under Time Domain Measurement Resource Restriction

The requirements for absolute accuracy of RSRQ in this clause shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers (TS 36.331 [2]).

The accuracy requirements in Table 9.1.5.2-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled,

RSRP_{dBm} according to Annex B.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.5.2-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction

Accı	Accuracy		Condition				
Normal	Extreme		lo ^{Note 2} range				
condition	condition	Ês/lot	E-UTRA operating band groups Note 5	Minimum Io	Maximum lo		
dB	dB	dB		$ m dBm/$ 15kHz $^{Note~1,~4}$	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	-50		
			FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±2.5	±4	≥-2 dB	FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±3.5	±4	≥-4 dB	Note 3	Note 3	Note 3		

- NOTE 1: This minimum lo condition is expressed as the average lo per RE over all REs in that symbol.
- NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The lo range defined by the minimum and the maximum lo levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
- NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

For time domain measurements restriction under colliding CRS with ABS configured in non-MBSFN subframes, requirements in Section 9.1.5.1 apply.

9.1.5.3 Absolute RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS assistance information

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers (TS 36.331 [2]) and the CRS assistance information is provided. The requirements apply for UEs supporting CRS interference handling.

The accuracy requirements in Table 9.1.5.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled,

RSRP_{dBm} according to Annex B.3.11 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern,

The UE is provided with the CRS assistance information (TS 36.331 [2]) and the CRS assistance information is valid throughout the entire evaluation period.

The requirements in this section shall also be met when the number of transmit antenna ports [16] of one or more cells whose CRS assistance information is provided [2] is different from the number of transmit antenna ports of the measured cell.

Table 9.1.5.3-1: RSRQ Intra frequency absolute accuracy under Time Domain Measurement Resource
Restriction with CRS assistance information

Accuracy			Conditions				
Normal	Extreme		lo Note 2 range				
condition	condition	Ês/lot Note 5	E-UTRA operating band groups ^{Note 6}	Minimum Io	Maximum lo		
dB	dB	dB		dBm/15kHz Note 1, 4	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	-50		
			FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±2.5	±4	≥-6.96	FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±3.5	±4	≥-9.46	Note 3	Note 3	Note 3		

- NOTE 1: This lo condition is expressed as the average lo per RE over all REs in that symbol.
- NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The specified Io range applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
- NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 5: The gap between the Es/lot level in table 9.1.5.3-1 and 9.1.5.2-1 is due to the interference from either PCell or at least one neighbour cell indicated within the CRS assistance information.
- NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

9.1.5.4 Absolute WB-RSRQ Accuracy

The requirements in this section shall apply when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [2]. The WB-RSRQ accuracy figures in Table 9.1.5.4-1 are relative to the value that would be obtained by using the *AllowedMeasBandwidth* in TS 36.331 [2].

The accuracy requirements in Table 9.1.5.4-1 are valid under the following conditions:

The value of the parameter, AllowedMeasBandwidth in TS 36.331 [2], is 50 resource blocks or larger

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [5] Clause 7.3 for reference sensitivity are fulfilled.

 $RSRP|dBm\ according\ to\ Annex\ B.3.1\ for\ a\ corresponding\ Band.$

-50

-50

-50

-50

Note 4

-118.5

-118

-117.5

-114.5

Note 4

±3.5

±4

Accuracy **Conditions** lo range Note 1 lo1-lo2 Note 2 Ês/lot Note 3 Normal **Extreme** E-UTRA operating band groups Note 6 Minimum Io Note 5 condition condition Maximum lo dB dB dB dB dBm/15kHz dBm/BW_{Channel} FDD_A, TDD_A -121 -50 FDD B -120.5 -50 FDD_C, TDD_C -120 -50 FDD_D -119.5-50 0 ≤lo1-FDD_E, TDD_E ±2.5 ±4 ≥-3 dB -119 -50 lo2

FDD_F

FDD_G

FDD_H

FDD_N

Note 4

Table 9.1.5.4-1: WB-RSRQ Intra frequency absolute accuracy

- lo is the average across all the resource blocks within the AllowedMeasBandwidth in TS 36.331 [2]. NOTE 1:
- Io1 is the lo level in the resource blocks other than central 6 resource blocks within the NOTE 2: AllowedMeasBandwidth in TS 36.331 [2] and lo2 is the lo level in central 6 resource blocks. The lo1 and lo2 have the same range as defined for lo.
- NOTE 3: lot is the received power spectrum density of total interference and noise for all the resource blocks, other than central 6 resource blocks.
- The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

≥-6 dB

9.1.5A Intra-frequency RSRQ Accuracy Requirements in High Doppler **Conditions**

The accuracy requirements in this clause are applicable for [EVA300 and EVA600] propagation conditions and assume independent interference (noise) at each receiver antenna port.

9.1.5A.1 Absolute RSRQ Accuracy in high Doppler conditions

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.5A.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band

Table 9.1.5A.1-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions					
Normal	Evtromo		lo Note 1 range				
Normal condition	Extreme condition	Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io		
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	-50		
	±5.5	±5.5 ≥-3 dB	FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±4			FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±5	±5.5	≥-6 dB	Note 2	Note 2	Note 2		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

9.1.6 Inter-frequency RSRQ Accuracy Requirements

9.1.6.1 Absolute RSRQ Accuracy

The requirements for absolute accuracy of RSRQ in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.6.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.3 for a corresponding Band

Table 9.1.6.1-1: RSRQ Inter frequency absolute accuracy

Accuracy		Conditions					
Normal	Evtrome		lo Note 1 range				
condition	condition	Extreme condition Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io		
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}		
	±4		FDD_A, TDD_A	-121	-50		
		±4 ≥-3 dB	FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±2.5			FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
		l	FDD_N	-114.5	-50		
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 3: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.6.2 Relative Accuracy of RSRQ

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.6.2-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2|dBm according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1 \right|_{dBm} - RSRP2 \Big|_{dBm} \right| \le 27 dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.6.2-1: RSRQ Inter frequency relative accuracy

Accuracy		Conditions					
Normal	Extreme	Ês/lot Note	lo Note 1 range				
condition	condition	2	E-UTRA operating band groups Note 5	Minimum Io	Maximum lo		
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}		
		≥-3 dB	FDD_A, TDD_A	-121	-50		
			FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±3	±4		FDD_E, TDD_E	-119	-50		
	<u> </u>		FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±4	±4	≥-6 dB	Note 3	Note 3	Note 3		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.1.6.3 Absolute WB-RSRQ Accuracy

The requirements in this section shall apply when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [2]. The WB-RSRQ accuracy figures in Table 9.1.6.3-1 are relative to the value that would be obtained by using the *AllowedMeasBandwidth* in TS 36.331 [2].

The accuracy requirements in Table 9.1.6.3-1 are valid under the following conditions:

The value of the parameter, Allowed Meas Bandwidth in TS 36.331 [2], is 50 resource blocks or larger

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [5] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band.

Conditions Accuracy lo range Note 1 lo1-lo2 Note 2 Ês/lot Note 3 Normal **Extreme** E-UTRA operating band groups Note 6 Minimum lo condition condition Maximum lo dB dB dB dB dBm/15kHz dBm/BW_{Channel} FDD_A, TDD_A -121 -50 FDD B -120.5 -50 FDD_C, TDD_C -120 -50 FDD_D -119.5 -50 0 ≤lo1-±2.5 ±4 ≥-3 dB FDD_E, TDD_E -119 -50 lo2 FDD_F -118.5 -50 FDD_G -118 -50 FDD_H -117.5 -50 FDD_N -114.5 -50 ±3.5 ±4 ≥-6 dB Note 4 Note 4 Note 4

Table 9.1.6.3-1: WB-RSRQ Inter frequency absolute accuracy

- NOTE 1: Io is the average across all the resource blocks within the AllowedMeasBandwidth in TS 36.331 [2].
- NOTE 2: lo1 is the lo level in the resource blocks other than central 6 resource blocks within the AllowedMeasBandwidth in TS 36.331 [2] and lo2 is the lo level in central 6 resource blocks. The lo1 and lo2 have the same range as defined for lo.
- NOTE 3: lot is the received power spectrum density of total interference and noise for all the resource blocks, other than central 6 resource blocks.
- NOTE 4: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

9.1.6.4 Relative WB-RSRQ Accuracy

The requirements in this section shall apply when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [2]. The WB-RSRQ accuracy figures in Table 9.1.6.4-1 are relative to the value that would be obtained by using the *AllowedMeasBandwidth* in TS 36.331 [2].

The accuracy requirements in Table 9.1.6.4-1 are valid under the following conditions:

The value of the parameter, *AllowedMeasBandwidth* in TS 36.331 [2], is 50 resource blocks or larger for the measured cells from different frequencies

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [5] Clause 7.3 for reference sensitivity are fulfilled.

 $RSRP1,2|_{dBm}$ according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1 \right|_{dBm} - RSRP2 \Big|_{dBm} \right| \le 27 dB$$

| Channel 1_Io -Channel 2_Io | $\leq 20~dB$

Table 9.1.6.4-1: WB-RSRQ Inter frequency relative accuracy

Accı	Accuracy		Conditions					
Normal	Extreme	Ês/lot	lo1-lo2	lo range ^{Note 1}				
	condition	Note 3	Note 2	E-UTRA operating band groups Note 6	Minimum Io	Maximum Io		
dB	dB	dB	dB		dBm/15kHz	dBm/BW _{Channel}		
	±4	≥-3 dB	0 ≤lo1- lo2	FDD_A, TDD_A	-121	-50		
				FDD_B	-120.5	-50		
				FDD_C, TDD_C	-120	-50		
				FDD_D	-119.5	-50		
±3				FDD_E, TDD_E	-119	-50		
				FDD_F	-118.5	-50		
				FDD_G	-118	-50		
				FDD_H	-117.5	-50		
				FDD_N	-114.5	-50		
±4	±4	≥-6 dB		Note 4	Note 4	Note 4		

- NOTE 1: Io is the average across all the resource blocks within the AllowedMeasBandwidth in TS 36.331 [2].
- NOTE 2: lo1 is the lo level in the resource blocks other than central 6 resource blocks within the AllowedMeasBandwidth in TS 36.331 [2] and lo2 is the lo level in central 6 resource blocks. The lo1 and lo2 have the same range as defined for lo.
- NOTE 3: lot is the received power spectrum density of total interference and noise for all the resource blocks, other than central 6 resource blocks. The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies
- NOTE 4: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

9.1.6A Inter-frequency RSRQ Accuracy Requirements in High Doppler Conditions

The accuracy requirements in this clause are applicable for [EVA300 and EVA600] propagation conditions and assume independent interference (noise) at each receiver antenna port.

9.1.6A.1 Absolute RSRQ Accuracy in high Doppler conditions

The requirements for absolute accuracy of RSRQ in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.6A.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.3 for a corresponding Band

Table 9.1.6A.1-1: RSRQ Inter frequency absolute accuracy

Accuracy		Conditions					
Normal	Extreme		lo Note 1 range				
condition	condition	Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum lo		
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}		
	±5.5		FDD_A, TDD_A	-121	-50		
		.5 ≥-3 dB	FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±4			FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±5	±5.5	≥-6 dB	Note 2	Note 2	Note 2		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.6A.2 Relative Accuracy of RSRQ in high Doppler conditions

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.6A.2-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2|dBm according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1 \right|_{dBm} - RSRP2 \Big|_{dBm} \right| \le 27 dB$$

| Channel 1_Io -Channel 2_Io | \leq 20 dB

Conditions Io Note 1 Accuracy range Ês/lot Note Normal **Extreme** E-UTRA operating band groups Note 5 condition condition Minimum Io Maximum lo dBm/15kHz Note dB dB dB dBm/BW_{Channel} FDD_A, TDD_A -121 -50 FDD B -120.5 -50 FDD_C, TDD_C -120 -50 FDD_D -119.5 -50 FDD_E, TDD_E ±3.5 ±5.0 ≥-3 dB -119 -50 FDD_F -118.5 -50 FDD G -118 -50 -117.5 FDD_H -50 FDD_N -114.5 -50 ±5.0 ≥-6 dB Note 3 Note 3 Note 3

Table 9.1.6A.2-1: RSRQ Inter frequency relative accuracy

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.
- NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 4: The condition level is increased by $\Delta > 0$, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.1.7 RSRQ Measurement Report Mapping

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Reported value Measured quantity value Unit RSRQ_-30 RSRQ < -34 dΒ RSRQ_-29 -34 ≤ RSRQ < -33.5 dB RSRQ -02 dB -20.5 ≤ RSRQ < -20 RSRQ_-01 -20 ≤ RSRQ < -19.5 dB RSRQ_00 dB RSRQ < -19.5 -19.5 ≤ RSRQ < -19 RSRQ_01 dB RSRQ 02 dB -19 ≤ RSRQ < -18.5 RSRQ 32 -4 ≤ RSRQ < -3.5 dB RSRQ_33 -3.5 ≤ RSRQ < -3 dB RSRQ_34 dB -3 ≤ RSRQ RSRQ_35 dB -3 ≤ RSRQ < -2.5 RSRQ_36 dΒ -2.5 ≤ RSRQ < -2 RSRQ_45 2 ≤ RSRQ < 2.5 dB RSRQ_46 2.5 ≤ RSRQ dB

Table 9.1.7-1: RSRQ measurement report mapping

Note: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in [31].

9.1.8 Power Headroom

The requirements in this clause shall apply for power headroom Type 1 and for power headroom Type 2, which are specified in clause 5.1.1.2 in [3].

For a UE not configured with a secondary cell, the power headroom provides the serving eNB with information about the differences between the UE configured maximum output power (P_{CMAX}) defined in TS 36.101 [5] and the estimated power for UL-SCH transmission of the serving cell [3]. In this case the UE shall meet requirements for power headroom Type 1.

For a UE configured with a secondary cell, the power headroom provides the serving eNB with information about the differences between the UE configured maximum output power ($P_{CMAX,c}$) defined in TS 36.101[5] and the estimated power for UL-SCH transmission per activated serving cell c, or the estimated power for simultaneous PUSCH and PUCCH transmission on PCell [3]. In this case the UE shall meet requirements for both power headroom Type 1 and Type 2.

9.1.8.1 Period

The reported power headroom shall be estimated over 1 subframe.

When *extendedPHR* is not configured [17], the Type 1 power headroom shall be estimated for the primary serving cell as defined in clause 5.1.1.2 in TS 36.213 [3].

When *extendedPHR* is configured [17], the Type 1 and Type 2 power headroom shall be estimated for each activated serving cell with configured uplink as defined in clause 5.1.1.2 in TS 36.213 [3].

9.1.8.2 Reporting Delay

The power headroom reporting delay is defined as the time between the beginning of the power headroom reference period and the time when the UE starts transmitting the power headroom over the radio interface. The reporting delay of the power headroom shall be 0 ms, which is applicable for all configured triggering mechanisms for power headroom reporting.

9.1.8.3 Void

9.1.8.4 Report Mapping

The power headroom reporting range is from -23 ...+40 dB. Table 9.1.8.4-1 defines the report mapping.

Reported value Measured quantity value (dB) POWER_HEADROOM_0 -23 ≤ PH < -22 POWER_HEADROOM_1 -22 ≤ PH < -21 POWER_HEADROOM_2 -21 ≤ PH < -20 POWER HEADROOM 3 -20 ≤ PH < -19 POWER_HEADROOM_4 -19 ≤ PH < -18 POWER_HEADROOM_5 -18 ≤ PH < -17 POWER HEADROOM 57 $34 \le PH < 35$ POWER_HEADROOM_58 $35 \le PH < 36$ POWER_HEADROOM_59 $36 \le PH < 37$ POWER_HEADROOM_60 $37 \le PH < 38$ POWER_HEADROOM_61 $38 \le PH < 39$ $39 \le \overline{PH} < 40$ POWER_HEADROOM_62 POWER_HEADROOM_63 PH ≥ 40

Table 9.1.8.4-1: Power headroom report mapping

9.1.9 UE Rx – Tx time difference

9.1.9.1 Measurement Requirement

The UE RX-TX time difference is measured from the PCell.

The accuracy requirements in Table 9.1.9.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

No changes to the uplink transmission timing are applied during the measurement period.

RSRP_{dBm} according to Annex B.3.5 for a corresponding Band

Table 9.1.9.1-1: UE Rx - Tx time difference measurement accuracy

	Conditions							
		Downlink	lo ^{Note 1} range					
Accuracy	Ês/lot	transmission bandwidth of PCell	E-UTRA operating band groups ^{Note 6}	Minimum Io	Maximum lo			
Ts Note 2	dB	MHz		dBm/15kHz Note 5	dBm/BW _{Channel}			
			FDD_A, TDD_A	-121	-50			
	≥-3 dB	≥1.4 MHz	FDD_B	-120.5	-50			
			FDD_C, TDD_C	-120	-50			
			FDD_D	-119.5	-50			
±20			FDD_E, TDD_E	-119	-50			
			FDD_F	-118.5	-50			
			FDD_G Note 4	-118	-50			
			FDD_H	-117.5	-50			
			FDD_N	-114.5	-50			
±14	≥-3 dB	≥ 3 MHz	Note 3	Note 3	Note 3			
±10	≥-3 dB	≥ 5 MHz	Note 3	Note 3	Note 3			
±7	≥-3 dB	≥10 MHz	Note 3	Note 3	Note 3			

NOTE 1: When in dBm/15kHz, the minimum lo condition is expressed as the average lo per RE over all REs in that symbol. Io may be different in different symbols within a subframe.

NOTE 2: Ts is the basic timing unit defined in TS 36.211.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding requirement with downlink bandwidth ≥1.4 MHz.

NOTE 4: Except Band 29 and Band 32.

NOTE 5: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

9.1.9.2 Measurement Report mapping

The reporting range of UE Rx - Tx time difference is defined from 0 to $20472T_s$ with $2T_s$ resolution for UE Rx - Tx time difference less than $4096T_s$ and 8Ts for UE Rx - Tx time difference equal to or greater than $4096T_s$.

The mapping of measured quantity is defined in Table 9.1.9.2-1.

Table 9.1.9.2-1: UE Rx - Tx time difference measurement report mapping

Reported value	Measured quantity value	Unit
RX-TX_TIME_DIFFERENCE_0000	$T_{UE\ Rx-Tx} < 2$	T _s
RX-TX_TIME_DIFFERENCE_0001	$2 \le T_{UE Rx-Tx} < 4$	Ts
RX-TX_TIME_DIFFERENCE_0002	$4 \le T_{UE Rx-Tx} < 6$	Ts

RX-TX_TIME_DIFFERENCE_2046	$4092 \le T_{UE Rx-Tx} < 4094$	T _s
RX-TX_TIME_DIFFERENCE_2047	$4094 \le T_{UE Rx-Tx} < 4096$	T _s
RX-TX_TIME_DIFFERENCE_2048	$4096 \le T_{UE Rx-Tx} < 4104$	Ts
RX-TX_TIME_DIFFERENCE_2049	4104 ≤ T _{UE Rx-Tx} < 4112	Ts
RX-TX_TIME_DIFFERENCE_4093	$20456 \le T_{UE Rx-Tx} < 20464$	T _s
RX-TX_TIME_DIFFERENCE_4094	$20464 \le T_{UE Rx-Tx} < 20472$	Ts
RX-TX_TIME_DIFFERENCE_4095	20472 ≤ Tue Ry-Ty	Ts

9.1.9.3 Measurement Requirement under Time Domain Measurement Resource Restriction

The requirements in this section apply for UE configured with a time-domain measurement resource restriction pattern for PCell measurements. The UE Rx-Tx time difference is measured from the Pcell.

The accuracy requirements in Table 9.1.9.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports,
- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled,
- No changes to the uplink transmission timing are applied during the measurement period,

RSRP_{dBm} according to Annex B.3.5 for a corresponding Band,

- The time domain measurement resource restriction pattern configured for the PCell indicates at least one subframe per radio frame for performing the PCell measurements [2],
- Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.9.3-1: UE Rx–Tx time difference measurement accuracy under time domain measurement resource restriction

	Conditions						
		Downlink	lo Note 1, 5 range				
Accuracy	Ês/lot Note 6	transmission bandwidth of PCell	E-UTRA operating band groups ^{Note 8}	Minimum Io	Maximum Io		
Ts Note 2	dB	MHz		dBm/15kHz Note 7	dBm/BW _{Channel}		
	≥-3 dB		FDD_A, TDD_A	-121	-50		
		2-3 dB ≤ 3 MHz	FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±20			FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G Note 4	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±10	≥-3 dB	≥ 5 MHz	Note 3	Note 3	Note 3		

NOTE 1: When in dBm/15kHz, the minimum lo condition is expressed as the average lo per RE over all REs in that symbol. Io may be different in different symbols within a subframe.

NOTE 2: Ts is the basic timing unit defined in TS 36.211.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding requirement with downlink bandwidth ≤ 3 MHz.

NOTE 4: Except Band 29 and Band 32.

NOTE 5: Io is defined for the subframes indicated by the time-domain measurement resource restriction pattern for serving cell measurements. The specified Io range applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.

NOTE 6: CRS Es/lot is in subframes indicated for PCell measurements by the time-domain measurement resource restriction pattern.

NOTE 7: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 8: E-UTRA operating band groups are as defined in Section 3.5.

NOTE: It is up to the UE implementation whether the UE Rx-Tx time difference measurement is performed in any subframe or in subframes indicated by the time-domain measurement resource restriction pattern.

9.1.9.4 Measurement Requirement when Time Domain Measurement Resource Restriction Pattern is Configured with CRS Assistance Information

The UE Rx-Tx time difference measurement is performed for the PCell.

For UE configured with a time-domain measurement resource restriction pattern for PCell measurements, the accuracy requirements in Table 9.1.9.4-1 apply provided that the following conditions are met for the PCell:

- PCell cell specific reference signals are transmitted from one, two or four antenna ports,
- Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled,
- No changes to the uplink transmission timing are applied during the measurement period,
- RSRP_{dBm} according to Annex B.3.13 for a corresponding Band,
- The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,
- Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern, and
- The UE is provided via PCell with the CRS assistance information (TS 36.331 [2]) and the CRS assistance information is valid throughout the entire evaluation period.

The requirements in this section shall also be met when the number of transmit antenna ports [16] of one or more cells whose CRS assistance information is provided [2] is different from the number of transmit antenna ports of the measured cell.

When the CRS assistance information is provided, the transmission bandwidth [30] in all intra-frequency cells in the CRS assistance information [2] is the same or larger than the transmission bandwidth of the PCell for which measurement is performed.

Table 9.1.9.4-1: UE Rx-Tx time difference measurement accuracy

	Conditions						
		Downlink	lo range Note 5				
Accuracy	CRS Ês/lot Note 6	transmission bandwidth of PCell	E-UTRA operating band groups Note 8	Minimum Io Note 1, 7	Maximum Io		
Ts Note 2	dB	MHz		dBm/15kHz Note 7	dBm/BW _{Channel}		
	≥-7.76	7.76 ≤ 3 MHz	FDD_A, TDD_A	-121	-50		
			FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±20			FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G Note 4	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±10	≥-7.76	≥ 5 MHz	Note 3	Note 3	Note 3		

NOTE 1: This lo condition is expressed as the average lo per RE over all REs in an OFDM symbol.

NOTE 2: Ts is the basic timing unit defined in TS 36.211.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding requirement with downlink bandwidth ≤ 3 MHz.

NOTE 4: Except Band 29 and Band 32.

NOTE 5: Io is defined in subframes indicated for PCell measurements by the time domain measurement resource restriction pattern. The specified Io range applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.

NOTE 6: CRS Ês/lot is in subframes indicated for PCell measurements by the time-domain measurement resource restriction pattern.

NOTE 7: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 8: E-UTRA operating band groups are as defined in Section 3.5.

NOTE: It is up to the UE implementation whether the UE Rx-Tx time difference measurement is performed in any subframe or in subframes indicated by the time-domain measurement resource restriction pattern.

9.1.10 Reference Signal Time Difference (RSTD)

NOTE: This measurement is used for UE positioning purposes.

9.1.10.1 Intra-Frequency Accuracy Requirement

The accuracy requirements in Table 9.1.10.1-1 are valid under the following conditions:

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

PRP 1,2|dBm according to Annex B.3.6 for a corresponding Band

There are no measurement gaps overlapping with the PRS subframes of the measured serving cell.

The parameter expected RSTDU ncertainty signalled over LPP by E-SMLC as defined in TS 36.355 [24] is less than 5 μ s.

Table 9.1.10.1-1: RSTD measurement accuracy

	Conditions									
		Minimum		lo ^{Note 7} range						
Accuracy	PRS Ês/lot	PRS bandwidth, which is minimum of serving cell channel bandwidth and the PRS bandwidths of the reference cell and the measured neighbour cell i Note 5	Minimum number of available measurement subframes among the reference cell and the measured neighbour cell i	E-UTRA operating band groups ^{Note 8}	Minimum Io ^{Note 1}	Maximum Io				
Ts Note 2	dB	RB			dBm/15kHz Note 6	dBm/BW _{Channe}				
	(PRS Ês/lot) _{ref} ≥-6dB and (PRS Ês/lot) _i ≥-13dB	≥ 6	6	FDD_A, TDD_A	-121	-50				
				FDD_B	-120.5	-50				
				FDD_C, TDD_C	-120	-50				
				FDD_D	-119.5	-50				
±15				FDD_E, TDD_E	-119	-50				
				FDD_F	-118.5	-50				
				FDD_G	-118	-50				
				FDD_H	-117.5	-50				
				FDD_N	-114.5	-50				
±10	(PRS Ês/lot) _{ref} ≥- 6dB and (PRS Ês/lot) _i ≥-13dB	≥ 15	6	Note 4	Note 4	Note 4				
±6	(PRS Ês/lot) _{ref} ≥- 6dB and (PRS Ês/lot) _i ≥-13dB	≥ 25	≥ 2	Note 4	Note 4	Note 4				
±5	(PRS Ês/lot) _{ref} ≥- 6dB and (PRS Ês/lot) _i ≥-13dB	≥ 50	≥1	Note 4	Note 4	Note 4				
±4	(PRS Ês/lot) _{ref} ≥- 6dB and (PRS Ês/lot) _i ≥-13dB	≥ 75	≥1	Note 4	Note 4	Note 4				

- NOTE 1: This minimum lo condition is expressed as the average lo per RE over all REs in an OFDM symbol.
- NOTE 2: Ts is the basic timing unit defined in TS 36.211 [16].
- NOTE 3: PRS bandwidth is as indicated in prs-Bandwidth in the OTDOA assistance data defined in [24].
- NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth ≥ 6 RB.
- NOTE 5: The serving cell, the reference cell, and the measured neighbour cell i are on the same carrier frequency.
- NOTE 6: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 7: The lo is defined in PRS positioning subframes. The same lo range applies to PRS and non-PRS symbols. lo levels are different in PRS and non-PRS symbols within the same subframe.
- NOTE 8: E-UTRA operating band groups are as defined in Section 3.5.

9.1.10.2 Inter-Frequency Accuracy Requirement

The accuracy requirements in Table 9.1.10.2-1 are valid under the following conditions:

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

PRP $1,2|_{dBm}$ according to Annex B.3.7 for a corresponding Band

There are no measurement gaps overlapping with the PRS subframes in cells belonging to the serving carrier frequency.

The parameter expected RSTD Uncertainty signalled over LPP by E-SMLC as defined in TS 36.355 [24] is less than $5 \mu s$.

Table 9.1.10.2-1: RSTD measurement accuracy

	Conditions									
		Minimum		Io Note 6 range						
Accuracy	PRS Ês/lot	PRS bandwidth which is minimum of serving cell channel bandwidth 7 and the PRS bandwidths of the reference cell and the measured neighbour cell i	Minimum number of available measurement subframes among the reference cell and the measured neighbour cell i	E-UTRA operating band groups ^{Note 8}	Minimum Io ^{Note 1}	Maximum Io				
Ts Note 2	dB	RB			dBm/15kHz Note 5	dBm/BW _{Chan}				
				FDD_A, TDD_A	-121	nel -50				
	(PRS Ês/lot) _{ref} ≥-6dB and			FDD_B	-120.5	-50				
		≥ 6	4	FDD_C, TDD_C	-120	-50				
				FDD_D	-119.5	-50				
±21				FDD_E, TDD_E	-119	-50				
	(PRS Ês/lot) _i ≥-13dB			FDD F	-118.5	-50				
				FDD_G	-118	-50				
				FDD_H	-117.5	-50				
				FDD_N	-114.5	-50				
±16	(PRS Ês/lot) _{ref} ≥-6dB and (PRS Ês/lot) _i ≥-13dB	≥ 15	4	Note 4	Note 4	Note 4				
±10	(PRS Ês/lot) _{ref} ≥-6dB and (PRS Ês/lot) _i ≥-13dB	≥ 25	≥ 2	Note 4	Note 4	Note 4				
±9	(PRS Ês/lot) _{ref} ≥-6dB and (PRS Ês/lot) _i ≥-13dB	≥ 50	≥1	Note 4	Note 4	Note 4				
±8	(PRS Ês/lot) _{ref} ≥-6dB and (PRS Ês/lot) _i ≥-13dB	≥ 75	≥ 1	Note 4	Note 4	Note 4				

- NOTE 1: This minimum lo condition is expressed as the average lo per RE over all REs in an OFDM symbol.
- NOTE 2: Ts is the basic timing unit defined in TS 36.211 [16].
- NOTE 3: PRS bandwidth is as indicated in prs-Bandwidth in the OTDOA assistance data defined in [24].
- NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth ≥ 6 RB.
- NOTE 5: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 6: The lo is defined in PRS positioning subframes. The same lo range applies to PRS and non-PRS symbols. Io levels are different in PRS and non-PRS symbols within the same subframe.
- NOTE 7: If a CA capable UE is configured with one or two SCell(s), the serving cell channel bandwidth is the minimum of the serving cell channel bandwidths in the component carriers involved in the RSTD measurement. If any of the serving cells is not involved in this RSTD measurement for CA, the channel bandwidth of that serving cell is not included in the determination of the minimum PRS bandwidth.
- NOTE 8: E-UTRA operating band groups are as defined in Section 3.5.

9.1.10.3 RSTD Measurement Report Mapping

The reporting range of RSTD is defined from -15391 T_s to 15391 T_s with 1 T_s resolution for absolute value of RSTD less or equal to 4096 T_s and 5 T_s for absolute value of RSTD greater than 4096 T_s .

The mapping of measured quantity is defined in Table 9.1.10.3-1.

Table 9.1.10.3-1: RSTD report mapping

Reported Value	Measured Quantity Value	Unit
RSTD_0000	-15391 > RSTD	$T_{\rm s}$
RSTD_0001	-15391 ≤ RSTD < -15386	$T_{\rm s}$
RSTD_2258	-4106 ≤ RSTD < -4101	$T_{\rm s}$
RSTD_2259	-4101 ≤ RSTD < -4096	$T_{\rm s}$
RSTD_2260	-4096 ≤ RSTD < -4095	$T_{\rm s}$
RSTD_2261	-4095 ≤ RSTD < -4094	$T_{\rm s}$

RSTD_6353	-3 ≤ RSTD < -2	Ts
RSTD_6354	-2 ≤ RSTD < -1	Ts
RSTD_6355	-1 ≤ RSTD ≤ 0	Ts
RSTD_6356	0 < RSTD ≤ 1	Ts
RSTD_6357	1 < RSTD ≤ 2	Ts
RSTD_6358	2 < RSTD ≤ 3	Ts
•••		•••
RSTD_10450	4094 < RSTD ≤ 4095	Ts
RSTD_10451	4095 < RSTD ≤ 4096	T _s
RSTD_10452	4096 < RSTD ≤ 4101	Ts
RSTD_10453	4101 < RSTD ≤ 4106	Ts
RSTD_12709	15381 < RSTD ≤ 15386	T _s
RSTD_12710	15386 < RSTD ≤ 15391	Ts
RSTD_12711	15391 < RSTD	T _s

9.1.11 Carrier aggregation measurement accuracy

This clause contains requirements on UE capabilities for support of E-UTRA FDD, TDD and TDD-FDD carrier aggregation. Requirements in this clause are applicable to all carrier aggregation capable UEs which have been configured with up to four downlink SCell(s). Note: This clause covers measurement accuracy requirements for frequencies corresponding to those used for the PCell and SCell(s); measurements of any other frequency are considered to be inter-frequency measurements covered by the accuracy requirements in clause 9.1.3 and 9.1.6

The requirements in this clause apply for bandwidths defined in the bandwidth combination set for the CA configurations supported by the UE [5].

9.1.11.1 Primary component carrier accuracy requirement

RSRP and RSRQ measurements of cells on the primary component carrier shall meet the intrafrequency absolute accuracy requirements in sections 9.1.2.1 and 9.1.5.1. Comparisons between RSRP of cells on the primary component carrier shall also meet the intra-frequency relative accuracy requirements in sections 9.1.2.2.

9.1.11.2 Secondary component carrier accuracy requirement

RSRP and RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intrafrequency absolute accuracy requirements in sections 9.1.2.1 and 9.1.5.1. Comparisons between RSRP of cells on the same secondary component carrier shall meet the intra-frequency relative accuracy requirements in sections 9.1.2.2

9.1.11.3 Primary and secondary component carrier relative accuracy requirement

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRP and RSRQ inter-frequency accuracy requirements in sections 9.1.3.2 and 9.1.6.2.

9.1.11.4 Secondary component carrier relative accuracy requirement

When measurements of cells on any of the secondary component carrier(s) are compared with measurements of cells on the other secondary component carrier, the applicable relative accuracy requirements are the RSRP and RSRQ interfrequency accuracy requirements in sections 9.1.3.2 and 9.1.6.2.

9.1.12 Reference Signal Time Difference (RSTD) Measurement Accuracy Requirements for Carrier Aggregation

This clause contains requirements for E-UTRA FDD, TDD and TDD-FDD carrier aggregation. This clause contains RSTD measurement accuracy requirements for a UE configured with one or two downlink SCell(s). The UE may operate in one of the E-UTRA carrier aggregations listed in clause 8.3.1. The requirements in this clause shall apply regardless whether the configured downlink secondary cell is activated or deactivated by the MAC-CE command [17]. The requirements apply for bandwidths defined in the bandwidth combination set for the CA configurations supported by the UE [5].

The RSTD measurements, which are obtained when both the reference cell and neighbouring cell belong to the primary component carrier, shall meet the intra-frequency RSTD accuracy requirements defined in clause 9.1.10.1.

The RSTD measurements, which are obtained when both the reference cell and neighbouring cell belong to the same secondary component carrier, shall meet the intra-frequency RSTD accuracy requirements defined in clause 9.1.10.1.

The RSTD measurements, which are obtained when the reference cell and neighbouring cell do not belong to the same carrier, shall meet the inter-frequency RSTD accuracy requirements defined in clause 9.1.10.2.

9.1.13 Measurement accuracy for UE category 0

9.1.13.1 Intra-frequency Absolute RSRP Accuracy for UE category 0

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category 0.

The accuracy requirements in Table 9.1.13.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.13.1-1: RSRP Intra frequency absolute accuracy for UE category 0

Accuracy			Conditions						
Normal	Extreme		Io ^{Note 1} range						
condition condition		Ês/lot	E-UTRA operating band groups Note 3	Minin	num lo	Maximum lo			
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}			
			FDD_A, TDD_A	-121	N/A	-70			
			FDD_B	-120.5	N/A	-70			
			FDD_C, TDD_C	-120	N/A	-70			
			FDD_D	-119.5	N/A	-70			
±7	±10	≥-6 dB	FDD_E, TDD_E	-119	N/A	-70			
			FDD_F	-118.5	N/A	-70			
			FDD_G	-118	N/A	-70			
			FDD_H	-117.5	N/A	-70			
				FDD_N	-114.5	N/A	-70		
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50			

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by ∆>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.13.2 Intra-frequency Relative Accuracy of RSRP for UE category 0

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category 0 UE.

The accuracy requirements in Table 9.1.13.2-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2 $|_{dBm}$ according to Annex B.3.8 for a corresponding Band.

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.13.2-1: RSRP Intra frequency relative accuracy for UE category 0

Accuracy		Conditions				
Normal	Evtromo	Ês/lot Note	lo Note 1 range			
condition	Normal Extreme condition	ES/10t	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io	
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	-50	
	±4	≥-3 dB	FDD_B	-120.5	-50	
			FDD_C, TDD_C	-120	-50	
			FDD_D	-119.5	-50	
±3			FDD_E, TDD_E	-119	-50	
			FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
			FDD_N	-114.5	-50	
±4	<u>±</u> 4	≥-6 dB	Note 3	Note 3	Note 3	

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.
- NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 4: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.1.13.3 Intra-frequency Absolute RSRQ Accuracy for UE category 0

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell for category 0 UE.

The accuracy requirements in Table 9.1.13.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRQ measurement assuming measured cell is identified cell.

Table 9.1.13.3-1: RSRQ Intra frequency absolute accuracy for UE category 0

Accı	ıracy	Conditions			
Normal	Extreme		lo Note 1 range		
condition	condition	Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}
			FDD_A, TDD_A	-121	-50
	±5		FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
±3.5		≥-3 dB	FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4.5	±5	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.14 Accuracy requirements for Discovery Signal Measurements

9.1.14.1 Introduction

Discovery signal measurements are performed when higher layers indicate measurements based on discovery signals according to DMTC configuration [2]. The discovery measurement accuracy requirements are defined for the following physical layer measurements performed in discovery signal occasions [16],

RSRP measured in subframes of the configured discovery signal occasions as specified in [4],

CSI-RSRP measurements specified in [4],

RSRQ measured in subframes of the configured discovery signal occasions as specified in [4].

9.1.14.2 RSRP measurements in discovery signal occasions

Intra-frequency absolute RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in Section 9.1.2.1.

Intra-frequency relative RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in Section 9.1.2.2.

Inter-frequency absolute RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in Section 9.1.3.1.

Inter-frequency relative RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in Section 9.1.3.2.

Measurement report mapping for RSRP measurements in discovery signal occasions are the same as specified in Section 9.1.4.

9.1.14.3 CSI-RSRP measurements in discovery signal occasions

9.1.14.3.1 Intra-frequency CSI-RSRP measurements

9.1.14.3.1.1 Absolute CSI-RSRP measurement requirements

In this clause, absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.14.3.1.1-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP,

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is specified in Annex B.3.14 for a corresponding Band.

Table 9.1.14.3.1.1-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accuracy			Conditions					
Normal	Extreme	CSI	lo Note 1 range					
condition			E-UTRA operating band groups Note 3	Minimum Io		Maximum lo		
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	N/A	-70		
			FDD_B	-120.5	N/A	-70		
			FDD_C, TDD_C	-120	N/A	-70		
			FDD_D	-119.5	N/A	-70		
±4.5	±9	≥ 0 dB	FDD_E, TDD_E	-119	N/A	-70		
			FDD_F	-118.5	N/A	-70		
			FDD_G	-118	N/A	-70		
			FDD_H	-117.5	N/A	-70		
			FDD_N	-114.5	N/A	-70		
±8	±11	≥0 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.14.3.1.2 Relative CSI-RSRP measurement requirements

In this section, the relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.14.3.1.2-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is specified in Annex B.3.15 for a corresponding Band.

Table 9.1.14.3.1.2-1: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions					
Marmal	Evtrome	CCI	lo ^{Note 1} range				
Normal Extreme condition		CSI Ês/lot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io		
dB	dB	dB	-	dBm/15kHz Note 4	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	-50		
			FDD_B	-120.5	-50		
			FDD_C, TDD_C	-120	-50		
			FDD_D	-119.5	-50		
±2	±3	≥0 dB	FDD_E, TDD_E	-119	-50		
			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_H	-117.5	-50		
			FDD_N	-114.5	-50		
±3	±3	≥ 0 dB	Note 3	Note 3	Note 3		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter CSI Ês/lot is the minimum CSI Ês/lot of the pair of cells or TPs to which the requirement applies.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 4: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.1.14.3.2 Inter-frequency CSI-RSRP measurements

9.1.14.3.2.1 Absolute CSI-RSRP measurement requirements

In this clause, absolute CSI-RSRP measurement accuracy requirements for discovery signal measurements apply to a cell or TP on a different carrier frequency from that of the serving cell.

The accuracy requirements in Table 9.1.14.3.2.1-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is specified in Annex B.3.16 for a corresponding Band.

Table 9.1.14.3.2.1-1: Inter-frequency absolute CSI-RSRP measurement accuracy

Accı	Accuracy Conditions						
Normal	Extreme	CSI	Io Note 1 range				
condition	condition	Ês/lot	E-UTRA operating band groups Note 3	Minim	um lo	Maximum lo	
dB	dB	dB	dBm/15kHz Note 2 dBm/BW _{Channe}		dBm/BW _{Channel}	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	N/A	-70	
		≥0 dB	FDD_B	-120.5	N/A	-70	
			FDD_C, TDD_C	-120	N/A	-70	
			FDD_D	-119.5	N/A	-70	
±4.5	±9		FDD_E, TDD_E	-119	N/A	-70	
			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_H	-117.5	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±8	±11	≥0 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.14.3.2.2 Relative CSI-RSRP measurement requirements

In this section, the relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on a different frequency from another cell or from another TP.

The accuracy requirements in Table 9.1.14.3.2.2-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is specified in Annex B.3.17 for a corresponding Band.

$$\left| CSI _RSRP1 \right|_{dBm} - CSI _RSRP2 \Big|_{dBm} \right| \le 27 dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Accuracy **Conditions** lo Note 1 range Normal **Extreme CSI** E-UTRA operating band Ês/lot Note 2 condition condition Minimum Io Maximum lo groups dBm/15kHz Note dB dB dB dBm/BW_{Channel} FDD_A, TDD_A -121 -50 FDD B -120.5 -50 FDD_C, TDD_C -120 -50 FDD_D -119.5 -50 ±4.5 ±6 ≥0 dB FDD_E, TDD_E -119 -50 FDD_F -118.5 -50 FDD_G -118 -50 FDD_H -117.5-50 FDD_N -114.5 -50

Table 9.1.14.3.2.2-1: Inter-frequency relative CSI-RSRP measurement accuracy

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The parameter CSI Ês/lot is the minimum CSI Ês/lot of the pair of cells or TPs to which the requirement applies.
- NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.14.3.3 CSI-RSRP measurement report mapping

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.14.3.3-1. The range in the signalling may be larger than the guaranteed accuracy range.

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP _01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP _02	-139 ≤ CSI_RSRP < -138	dBm
***	***	•••
CSI_RSRP _95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP _96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP _97	-44 ≤ CSI_RSRP	dBm

Table 9.1.14.3.3-1: CSI-RSRP measurement report mapping

9.1.14.4 RSRQ measurements in discovery signal occasions

Intra-frequency absolute RSRQ measurement accuracy requirements in discovery signal occasions are the same as specified in Section 9.1.5.1.

Inter-frequency absolute RSRQ measurement accuracy requirements in discovery signal occasions are the same as specified in Section 9.1.6.1.

Inter-frequency relative RSRQ measurement accuracy requirements in discovery signal occasions are the same as specified in Section 9.1.6.2.

Measurement report mapping for RSRQ measurements in discovery signal occasions are the same as specified in Section 9.1.7.

9.1.15 Discovery signal measurements accuracy for E-UTRAN carrier aggregation

This clause contains requirements on UE capabilities for support of E-UTRA FDD, TDD and TDD-FDD carrier aggregation when discovery signal [16] is configured. Requirements in this clause are applicable to all carrier aggregation capable UEs which have been configured with up to four downlink SCell(s). Note: This clause covers measurement accuracy requirements for frequencies corresponding to those used for the PCell and SCell(s).

Measurements of any other frequency are considered to be inter-frequency measurements covered by the accuracy requirements in clause 9.1.14.

The requirements in this clause apply for bandwidths defined in the bandwidth combination set for the CA configurations supported by the UE [5].

9.1.15.1 Requirements for CRS based discovery signal measurements accuracy for E-UTRAN carrier aggregation

9.1.15.1.1 Primary component carrier accuracy requirement

RSRP and RSRQ measurements of cells on the primary component carrier shall meet the intrafrequency absolute accuracy requirements in sections 9.1.14.2 and 9.1.14.4. Comparisons between RSRP of cells on the primary component carrier shall also meet the intra-frequency relative accuracy requirements in sections 9.1.14.2.

9.1.15.1.2 Secondary component carrier accuracy requirement

RSRP and RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intrafrequency absolute accuracy requirements in sections 9.1.14.2 and 9.1.14.4. Comparisons between RSRP of cells on the same secondary component carrier shall meet the intra-frequency relative accuracy requirements in sections 9.1.14.2.

9.1.15.1.3 Primary and secondary component carrier relative accuracy requirement

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRP and RSRQ inter-frequency accuracy requirements in sections 9.1.14.2 and 9.1.14.4.

9.1.15.1.4 Secondary component carrier relative accuracy requirement

When measurements of cells on any of the secondary component carrier(s) are compared with measurements of cells on the other secondary component carrier, the applicable relative accuracy requirements are the RSRP and RSRQ interfrequency accuracy requirements in sections 9.1.14.2 and 9.1.14.4.

9.1.15.2 Requirements for CSI-RS based discovery signal measurements accuracy for E-UTRAN carrier aggregation

9.1.15.2.1 Primary component carrier accuracy requirement

RSRP measurements of cells on the primary component carrier shall meet the intrafrequency absolute accuracy requirements in sections 9.1.14.3.1.1. Comparisons between RSRP of cells on the primary component carrier shall also meet the intra-frequency relative accuracy requirements in sections 9.1.14.3.1.2.

9.1.15.2.2 Secondary component carrier accuracy requirement

RSRP measurements of cells on any of the secondary component carrier(s) shall meet the intrafrequency absolute accuracy requirements in sections 9.1.14.3.1.1. Comparisons between RSRP of cells on the same secondary component carrier shall meet the intra-frequency relative accuracy requirements in sections 9.1.14.3.1.2.

9.1.15.2.3 Primary and secondary component carrier relative accuracy requirement

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRP inter-frequency accuracy requirements in sections 9.1.14.3.2.2.

9.1.15.2.4 Secondary component carrier relative accuracy requirement

When measurements of cells on any of the secondary component carrier(s) are compared with measurements of cells on the other secondary component carrier, the applicable relative accuracy requirements are the RSRP inter-frequency accuracy requirements in sections 9.1.14.3.2.2.

9.1.16 Accuracy requirements for RSRQ measurement on all OFDM symbols

This clause contains requirements for RSRQ measurement when measurement configuration message received by the UE contains *measRSRQ-OnAllSymbols-r12* parameter in TS 36.331 [2].

Intra-frequency absolute RSRQ measurement accuracy requirements when measured on all OFDM symbols are the same as specified in Section 9.1.5.1.

Inter-frequency absolute RSRQ measurement accuracy requirements when measured on all OFDM symbols are the same as specified in Section 9.1.6.1.

Inter-frequency relative RSRQ measurement accuracy requirements when measured on all OFDM symbols are the same as specified in Section 9.1.6.2.

NOTE: The minimum Io condition in Table 9.1.5.1-1, Table 9.1.6.1-1 and Table 9.1.6.2-1 is expressed as the average Io per RE over all REs in that symbol.

NOTE: The Io range defined by the minimum and the maximum Io levels in Table 9.1.5.1-1, Table 9.1.6.1-1 and Table 9.1.6.2-1 applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.

NOTE: Iot in Table 9.1.5.1-1, Table 9.1.6.1-1 and Table 9.1.6.2-1 is the received power spectrum density of total interference and noise averaged over CRS REs.

Intra-frequency absolute WB-RSRQ measurement accuracy requirements when measured on all OFDM symbols are the same as specified in Section 9.1.5.4.

Inter-frequency absolute WB-RSRQ measurement accuracy requirements when measured on all OFDM symbols are the same as specified in Section 9.1.6.3.

Inter-frequency relative WB-RSRQ measurement accuracy requirements when measured on all OFDM symbols are the same as specified in Section 9.1.6.4.

NOTE: The minimum Io condition in Table 9.1.5.4-1, Table 9.1.6.3-1 and Table 9.1.6.4-1 is expressed as the average Io per RE over all REs in that symbol across all the resource blocks within the *AllowedMeasBandwidth* in TS 36.331 [2].

NOTE: The Io1, Io2 and Io range defined by the minimum and the maximum Io levels in Table 9.1.5.4-1, Table 9.1.6.3-1 and Table 9.1.6.4-1 applies to CRS and non-CRS symbols. Io1, Io2 and Io may be different in different symbols within a subframe.

NOTE: Iot in Table 9.1.5.4-1, Table 9.1.6.3-1 and Table 9.1.6.4-1 is the received power spectrum density of total interference and noise averaged over CRS REs.

9.1.17 RS-SINR Measurements

9.1.17.1 Measurement Report Mapping

The reporting range of RS-SINR measurement is defined from -23 dB to 40 dB with 0.5 dB resolution.

The mapping of the measured quantity is defined in table 9.1.17.3-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.17.1-1: RS-SINR measurement report mapping

Reported Value	Measured Quantity Value	Unit
RS-SINR_000	RS-SINR < -23	dB
RS-SINR_001	-23 ≤ RS-SINR < -22.5	dB

RS-SINR_126	39.5 ≤ RS-SINR < 40	dB
RS-SINR_127	40 ≤ RS-SINR	dB

9.1.17.2 Intra-frequency RS-SINR Measurement Accuracy Requirements

9.1.17.2.1 Absolute RS-SINR Measurement Accuracy Requirements

The requirements for absolute accuracy of intra-frequency RS-SINR in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.17.2.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.18 for a corresponding Band.

Table 9.1.17.2.1-1: Intra-frequency RS-SINR absolute accuracy

Accı	ıracy	Conditions				
Normal	Extreme		Io Note 1 range			
condition	condition	Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum lo	
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}	
	±TBD) ≥-3 dB	FDD_A, TDD_A	-121	-50	
			FDD_C, TDD_C	-120	-50	
			FDD_D	-119.5	-50	
±TBD			FDD_E, TDD_E	-119	-50	
TIBD	ΣΙΒυ		FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
			FDD_N	-114.5	-50	
±TBD	±TBD	≥-6 dB	Note 2	Note 2	Note 2	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 3: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.17.3 Inter-frequency RS-SINR Measurement Accuracy Requirements

9.1.17.3.1 Absolute RS-SINR Measurement Accuracy Requirements

The requirements for absolute accuracy of inter-frequency RS-SINR in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.17.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.19 for a corresponding Band.

Table 9.1.17.3.1-1: Inter-frequency RS-SINR absolute accuracy

Accuracy		Conditions				
Normal	Extreme		lo Note 1 range			
condition condition		Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum lo	
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	-50	
	±TBD	5D ≥-3 dB	FDD_C, TDD_C	-120	-50	
			FDD_D	-119.5	-50	
±TBD			FDD_E, TDD_E	-119	-50	
TIDD			FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
		,	FDD_N	-114.5	-50	
±TBD	±TBD	≥-6 dB	Note 2	Note 2	Note 2	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.17.3.2 Relative RS-SINR Measurement Accuracy Requirements

The relative accuracy of inter-frequency RS-SINR in this clause is defined as the RS-SINR measured from one cell compared to the RS-SINR measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.17.3.2-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2|_{dBm} according to Annex B.3.20 for a corresponding Band.

$$\left| RSRP1 \right|_{dBm} - RSRP2 \Big|_{dBm} \right| \le 27 dB$$

| Channel 1_Io - Channel 2_Io | ≤ 20 dB

Table 9.1.17.3.2-1: Inter-frequency RS-SINR relative accuracy

Accuracy		Conditions				
Normal	Extreme	Ês/lot Note	lo ^{Note 1} range			
condition			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io	
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}	
	±TBD		FDD_A, TDD_A	-121	-50	
		≥-3 dB	FDD_C, TDD_C	-120	-50	
			FDD_D	-119.5	-50	
±TBD			FDD_E, TDD_E	-119	-50	
TIDD		≥-3 ub	FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
			FDD_N	-114.5	-50	
±TBD	±TBD	≥-6 dB	Note 3	Note 3	Note 3	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 4: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.1.18 Accuracy Requirements for Measurements under Operation with Frame Structure 3

9.1.18.1 Introduction

The accuracy requirements in this section are defined for the following physical layer measurements: RSRP, RSRQ, CSI-RSRP, and RSSI, where the measurements are performed on cells of E-UTRA carriers during the configured DMTC occasion [2] under operation with frame structure 3 [16].

9.1.18.2 RSRP measurements

9.1.18.2.1 RSRP measurement report mapping

The measurement report mapping for RSRP measurements is as defined in Section 9.1.4.

- 9.1.18.2.2 Inter-frequency absolute RSRP measurement accuracy requirements Editor's node: requirements are TBD.
- 9.1.18.2.3 Inter-frequency relative RSRP measurement accuracy requirementsNOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].Editor's node: requirements are TBD.
- 9.1.18.2.4 Intra-frequency absolute RSRP measurement accuracy requirements

 NOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].

 Editor's node: requirements are TBD.
- 9.1.18.2.5 Intra-frequency relative RSRP measurement accuracy requirementsNOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].Editor's node: requirements are TBD.

9.1.18.3 RSRQ measurements

9.1.18.3.1 RSRQ measurement report mapping

The measurement report mapping for RSRQ measurements is as defined in Section 9.1.7.

- 9.1.18.3.2 Inter-frequency absolute RSRQ measurement accuracy requirements Editor's node: requirements are TBD.
- 9.1.18.3.3 Inter-frequency relative RSRQ measurement accuracy requirementsNOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].Editor's node: requirements are TBD.
- 9.1.18.3.4 Intra-frequency absolute RSRQ measurement accuracy requirements NOTE: These requirements are applicable only for CA under operation with frame structure 3 [16]. Editor's node: requirements are TBD.

9.1.18.4 CSI-RSRP measurements

9.1.18.4.1 CSI-RSRP measurement report mapping

The measurement report mapping for CSI-RSRP measurements is as defined in Section 9.1.14.3.3.

9.1.18.4.2 Inter-frequency absolute CSI-RSRP measurement accuracy requirements

Editor's node: requirements are TBD.

9.1.18.4.3 Inter-frequency relative CSI-RSRP measurement accuracy requirements

NOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].

Editor's node: requirements are TBD.

9.1.18.4.4 Intra-frequency absolute CSI-RSRP measurement accuracy requirements

NOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].

In this clause, absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on a serving carrier frequency operating under frame structure 3 [3].

The accuracy requirements in Table 9.1.18.4.4-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP,

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in Annex B.3.21.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.18.4.4-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accı	ıracy		Conditions			
Normal	Extreme	CSI		lo ^{Note 1} range		
condition	condition	Ês/lot	E-UTRA operating band groups Note 3	Minimum Io		Maximum lo
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}
[±4.5]	[±9]	≥0 dB	FS3_G	-118	N/A	-70
[±8]	[±11]	≥0 dB	FS3 G	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.18.4.5 Intra-frequency relative CSI-RSRP measurement accuracy requirements

NOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].

In this section, the relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP operating under frame structure 3 [16]. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.18.4.5-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in Annex B.3.22.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.18.4.5-1: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy			Conditions				
Normal Extreme		CSI	lo ^{Note 1} range				
condition	condition	Ês/lot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum lo		
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}		
[±2]	[±3]	≥ 0 dB	FS3_G	-118	-50		
[±3]	[±3]	≥ 0 dB	Note 3	Note 3	Note 3		

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The parameter CSI Ês/lot is the minimum CSI Ês/lot of the pair of cells or TPs to which the requirement applies.
- NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 4: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.1.18.5 RSSI measurements

9.1.18.5.1 RSSI measurement report mapping

The reporting range of RSSI measurement is defined from -100 dBm to -25 dBm with 1 dBm resolution.

The mapping of the measured quantity is defined in table 9.1.18.5.1-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.18.5.1-1: RSSI measurement report mapping

Reported value	Measured quantity value	Unit
RSSI_00	RSSI < -100	dBm
RSSI_01	-100 ≤ RSSI < -99	dBm
RSSI_02	-99 ≤ RSSI < -98	dBm
RSSI_74	-27 ≤ RSSI < -26	dBm
RSSI_75	-26 ≤ RSSI < -25	dBm
RSSI_76	-25 ≤ RSSI	dBm

9.1.18.5.2 Intra-frequency absolute RSSI measurement accuracy requirements

NOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].

The intra-frequency RSSI requirements are specified in Table 9.1.18.5.2-1. The requirements apply for any configured RSSI *measDuration* [2], provided that:

- All symbols duing each RSSI measurement duration are available for RSSI sampling within the same reporting interval.

Table 9.1.18.5.2-1: Intra-frequency RSSI accuracy

Accuracy		Conditions			
Normal	Extreme	Io Note 1 range			
condition	condition	E-UTRA operating band groups Note 4	Minimum Io	Maximum lo	
dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}	
±2.5	±5.5	FS3_G	-118	-50	
±4.5	±7.5	Note 2	Note 2	Note 2	

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 3: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.1.18.5.3 Inter-frequency absolute RSSI measurement accuracy requirements

The inter-frequency RSSI requirements are the same as specified in Section 9.1.18.5.2.

9.1.19 Accuracy Requirements for Carrier Aggregation for Measurements under Operation with Frame Structure 3

9.1.19.1 Introduction

The accuracy requirements in this section are defined for the following physical layer measurements: RSRP, RSRQ, CSI-RSRP, and RSSI, where the measurements are performed on cells of E-UTRA carriers during the configured DMTC occasion [2] under operation with frame structure 3 [16].

9.1.19.2 Accuracy requirements for measurements on SCC

The requirements in this section are for the measurements on cells of E-UTRA carriers operated under frame structure 3 on one SCC.

Absolute RSRP measurements of cells on SCC shall meet the intra-frequency absolute accuracy requirements in Section 9.1.18.2.4.

Comparisons between RSRP measurements of cells on the same SCC shall meet the intra-frequency relative accuracy requirements in Section 9.1.18.2.5.

Absolute RSRQ measurements of cells on SCC shall meet the intra-frequency absolute accuracy requirements in Section 9.1.18.3.4.

CSI-RSRP measurements of cells on SCC shall meet the intra-frequency absolute accuracy requirements in Section 9.1.18.4.4.

Comparisons between CSI-RSRP measurements of cells on the same SCC shall meet the intra-frequency relative accuracy requirements in Section 9.1.18.4.5.

RSSI measurements on SCC shall meet the intra-frequency absolute accuracy requirements in Section 9.1.18.5.3.

9.1.19.3 Relative accuracy requirements for measurements on different SCCs

The requirements in this section are for the measurements on cells of E-UTRA carriers operated under frame structure 3 on two different SCCs.

When RSRP measurements of cells on any of the SCC are compared with RSRP measurements of cells on the other SCC, the applicable relative accuracy requirements are the inter-frequency relative RSRP measurement accuracy requirements in Section 9.1.18.2.3.

When RSRQ measurements of cells on any of the SCC are compared with RSRQ measurements of cells on the other SCC, the applicable relative accuracy requirements are the inter-frequency relative RSRQ measurement accuracy requirements in Section 9.1.18.3.3.

When CSI-RSRP measurements of cells on any of the SCC are compared with CSI-RSRP measurements of cells on the other SCC, the applicable relative accuracy requirements are the inter-frequency relative CSI-RSRP measurement accuracy requirements in Section 9.1.18.4.3.

9.1.20 SFN and Subframe Time Difference (SSTD)

9.1.20.1 SSTD Accuracy Requirement

The SFN and subframe time difference (SSTD) is measured between MeNB and SeNB.

The accuracy requirements in Table 9.1.20.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

No changes to the uplink transmission timing are applied during the measurement period.

RSRP_{dBm} according to Annex B.3.5 for a corresponding Band

Table 9.1.20.1-1: SFN and subframe time difference measurement accuracy

		Conditions								
		MIN(PCell downlink	lo Note 1 range							
Accuracy	Ês/lot	transmission Bandwidth, PSCell downlink transmission Bandwidth)	E-UTRA operating band groups Note 6	Minimum Io	Maximum lo					
Ts Note 2	dB	MHz		dBm/15kHz Note 5	dBm/BW _{Channel}					
	>-3 dB		FDD_A, TDD_A	-121	-50					
			FDD_C, TDD_C	-120	-50					
		≥1.4 MHz	FDD_D	-119.5	-50					
±52			FDD_E, TDD_E	-119	-50					
±32	∠-3 UD		FDD_F	-118.5	-50					
			FDD_G Note 4	-118	-50					
			FDD_H	-117.5	-50					
			FDD_N	-114.5	-50					
±40	≥-3 dB	≥ 3 MHz	Note 3	Note 3	Note 3					

NOTE 1: When in dBm/15kHz, the minimum lo condition is expressed as the average lo per RE over all REs in that symbol. Io may be different in different symbols within a subframe.

NOTE 2: Ts is the basic timing unit defined in TS 36.211.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding requirement with downlink bandwidth ≥1.4 MHz.

NOTE 4: Except Band 29 and Band 32.

NOTE 5: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

9.1.20.2 SSTD Measurement Report Mapping

SFN and subframe timing difference (SSTD) measurement report comprises 3 elements:

SFN offset between MeNB and SeNB (ΔX)

Reporting range of ΔX is between frame number # 0 to frame number # 1023 as defined in TS 36.331 [2].

Frame boundary offset between MeNB and SeNB (ΔY)

Reporting range of ΔY is between subfrane number #-4 and subframe number # 5 as defined in TS 36.331 [2].

Subframe boundary offset between MeNB and SeNB (ΔZ)

The reporting range of absolute value of ΔZ is between 700Ts and 1320Ts with reporting granularity of 10Ts.

The mapping of measured Subframe boundary offset (ΔZ) is defined in Table 9.1.20.2-1.

Table 9.1.20.2-1: SSTD report mapping

Reported Value	Measured Quantity Value	Unit
SUBFRAME_BOUNDARY_OFFSET_00	abs(ΔZ) ≤ 700	$T_{\rm s}$
SUBFRAME_BOUNDARY_OFFSET_01	700 < abs(ΔZ) ≤ 710	T_{s}
SUBFRAME_BOUNDARY_OFFSET_02	710 < abs(ΔZ) ≤ 720	Ts

SUBFRAME_BOUNDARY_OFFSET_61	1300 < abs(ΔZ) ≤ 1310	T _s
SUBFRAME_BOUNDARY_OFFSET_62	1310 < abs(ΔZ) ≤ 1320	Ts
SUBFRAME_BOUNDARY_OFFSET_63	1320 <abs(δz)< td=""><td>T_s</td></abs(δz)<>	T _s

9.1.21 Measurement accuracy for UE category M1

9.1.21.1 Intra-frequency Absolute RSRP Accuracy for UE category M1 with CE mode A

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category M1.

The accuracy requirements in Table 9.1.21.1-1 and Table 9.1.21.1-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.21.1-1: RSRP Intra frequency absolute accuracy for UE category M1 with CE mode A for FDD and TDD

Accuracy			Conditions					
Normal	Extreme		lo Note 1 range					
condition	condition	Ês/lot	E-UTRA operating band groups Note 3	Minin	num lo	Maximum lo		
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}		
	±10		FDD_A, TDD_A	-121	N/A	-70		
		≥-6 dB	FDD_D	-119.5	N/A	-70		
17			FDD_E, TDD_E	-119	N/A	-70		
±7			FDD_F	-118.5	N/A	-70		
			FDD_G	-118	N/A	-70		
			FDD_N	-114.5	N/A	-70		
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_N	N/A	-70	-50		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.21.1-2: RSRP Intra frequency absolute accuracy for UE category M1 with CE mode A for HD-FDD

Accuracy		Conditions					
Normal	Extreme	lo Note 1 range					
condition	condition	Ês/lot	E-UTRA operating band groups Note 3	Minim	num lo	Maximum lo	
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}	
		±10 ≥-6 dB	FDD_A	-121	N/A	-70	
			FDD_D	-119.5	N/A	-70	
±7	140		FDD_E	-119	N/A	-70	
±/	±10		FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±9	±12	≥-6 dB	FDD_A, FDD_D, FDD_E, FDD_F, FDD_G, FDD_N	N/A	-70	-50	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.21.2 Intra-frequency Relative Accuracy of RSRP for UE category M1 with CE mode A

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category M1 UE.

The accuracy requirements in Table 9.1.13.2-1 and Table 9.1.13.2-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2_{|dBm} according to Annex B.3.8 for a corresponding Band.

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.21.2-1: RSRP Intra frequency relative accuracy for UE category M1 with CE mode A for FDD and TDD

Accuracy		Conditions					
Normal	Extreme	Êc/lot Note	lo ^{Note 1} range				
Normal condition	condition	Ês/lot Note	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io		
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}		
			FDD_A, TDD_A	-121	-50		
			FDD_D	-119.5	-50		
1.2		> 0 -ID	FDD_E, TDD_E	-119	-50		
±3	±4	≥-3 dB	FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_N	-114.5	-50		
±4	±4	≥-6 dB	Note 3	Note 3	Note 3		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 4: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.21.2-2: RSRP Intra frequency relative accuracy for UE category M1 with CE mode A for HD-FDD

Accuracy		Conditions					
Mormal	Extreme	Ês/lot Note	lo ^{Note 1} range				
Normal Extreme condition		2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io		
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}		
			FDD_A	-121	-50		
		≥-3 dB	FDD_D	-119.5	-50		
1.0			FDD_E	-119	-50		
±3	±4		FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_N	-114.5	-50		
±4	±4	≥-6 dB	Note 3	Note 3	Note 3		

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.
- NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 4: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.1.21.3 Intra-frequency Absolute RSRP Accuracy for UE category M1 with CE mode B

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category M1.

The accuracy requirements in Table 9.1.21.3-1 and Table 9.1.21.3-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.21.3-1: RSRP Intra frequency absolute accuracy for UE category M1 with CE mode A for FDD and TDD

Accuracy		Conditions					
Normal Extreme		_	lo Note 1 range				
condition	condition	Ês/lot	E-UTRA operating band groups ^{Note 3}	Minin	num lo	Maximum lo	
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}	
	±11	±11 ≥-6 dB	FDD_A, TDD_A	-121	N/A	-70	
			FDD_D	-119.5	N/A	-70	
±8			FDD_E, TDD_E	-119	N/A	-70	
五〇			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±10	±13	≥-6 dB	FDD_A, TDD_A, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_N	N/A	-70	-50	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.21.3-2: RSRP Intra frequency absolute accuracy for UE category M1 with CE mode A for HD-FDD

Accuracy		Conditions					
Normal	Extreme		lo Note 1 range				
condition	condition	Ês/lot	E-UTRA operating band groups Note 3	Minim	num lo	Maximum Io	
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}	
		11 ≥-6 dB	FDD_A	-121	N/A	-70	
			FDD_D	-119.5	N/A	-70	
. 0	144		FDD_E	-119	N/A	-70	
±8	±11		FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±10	±13	≥-6 dB	FDD_A, FDD_D, FDD_E, FDD_F, FDD_G, FDD_N	N/A	-70	-50	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.1.21.4 Intra-frequency Relative Accuracy of RSRP for UE category M1 with CE mode B

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category M1 UE.

The accuracy requirements in Table 9.1.21.4-1 and Table 9.1.21.4-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2_{|dBm} according to Annex B.3.8 for a corresponding Band.

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.21.4-1: RSRP Intra frequency relative accuracy for UE category M1 with CE mode A for FDD and TDD

Accuracy			Conditions				
Normal	Extreme	Êc/lot Note	Io Note 1 range				
condition	condition	Ês/lot Note	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io		
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}		
	±5		FDD_A, TDD_A	-121	-50		
		±5 ≥-3 dB	FDD_D	-119.5	-50		
1.4			FDD_E, TDD_E	-119	-50		
±4			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_N	-114.5	-50		
±5	±5	≥-6 dB	Note 3	Note 3	Note 3		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 4: The condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.21.4-2: RSRP Intra frequency relative accuracy for UE category M1 with CE mode A for HD-FDD

Accuracy			Conditions				
Normal	Extreme	Ês/lot Note	lo ^{Not}	^{e 1} range			
condition	condition	2	E-UTRA operating band groups Note 5	Minimum Io	Maximum lo		
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}		
	±5		FDD_A	-121	-50		
		±5 ≥-3 dB	FDD_D	-119.5	-50		
			FDD_E	-119	-50		
±4			FDD_F	-118.5	-50		
			FDD_G	-118	-50		
			FDD_N	-114.5	-50		
±5	±5	≥-6 dB	Note 3	Note 3	Note 3		

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of cells to which the requirement applies.

NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

9.2 UTRAN FDD Measurements

The requirements in this clause are applicable for a UE:

- in state RRC CONNECTED
- performing measurements according to clause 8.1.2.4 with appropriate measurement gaps
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS 25.302 [6].

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

9.2.1 UTRAN FDD CPICH RSCP

NOTE: This measurement is for handover between E-UTRAN and UTRAN FDD and for SON.

The requirements in this clause are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is specified in clauses 8.1.2.4.1 and 8.1.2.4.2.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in table 9.2.1-1, under the following conditions:

- CPICH Ec/Io condition for a detectable cell is as specified in clauses 8.1.2.4.1, 8.1.2.4.2, 8.1.2.4.7, 8.1.2.4.8;
- SCH_Ec/Io condition for a detectable cell is as specified in clauses 8.1.2.4.1, 8.1.2.4.2, 8.1.2.4.7, 8.1.2.4.8.

Accuracy		Conditions				
Normal	Extreme	lo r	lo range			
condition	condition	UTRA operating bands	Minimum Io	Maximum Io		
dB	dB		dBm/3.84 MHz	dBm/3.84 MHz		
	±9	Band I, IV, VI, X XI, XIX and XXI	-94	-70		
		Band IX	-93	-70		
±6		Band II, V and VII	-92	-70		
±θ		Band III, VIII, XII, XIII, XIV , XX and XXII	-91	-70		
		Band XXV, XXVI Note 1	-90.5	-70		
±8	±11	Note 2	-70	-50		

Table 9.2.1-1: UTRAN FDD CPICH_RSCP absolute accuracy

NOTE 1: For Band XXVI, the condition has the minimum lo of -92 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

NOTE 2: The same bands apply for this requirement as for the corresponding highest accuracy requirement.

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the relevant UTRAN FDD measurement procedure and measurement gap pattern stated in clause 8.1.2.4 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP in TS 25.133 [18] shall apply.

9.2.2 Void

9.2.3 UTRAN FDD CPICH Ec/No

NOTE: This measurement is for handover between E-UTRAN and UTRAN FDD and for SON.

The requirements in this clause are valid for terminals supporting this capability.

The measurement period for RRC CONNECTED state is specified in clauses 8.1.2.4.1 and 8.1.2.4.2.

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No in TS 25.133 [18].

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in clause 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH Ec/No in TS 25.133 [18] shall apply.

9.3 UTRAN TDD Measurements

The requirements in this clause are applicable for a UE:

- in state RRC CONNECTED
- performing measurements according to clause 8.1.2.4 with appropriate measurement gaps
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS 25.302 [6].

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

9.3.1 UTRAN TDD P-CCPCH RSCP

NOTE: This measurement is for handover between E-UTRAN and UTRAN TDD and for SON.

The requirements in this clause are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is specified in clauses 8.1.2.4.3 and 8.1.2.4.4.

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for TDD P-CCPCH in TS 25.123 [19].

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN TDD measurements, the relevant UTRAN TDD measurement procedure and measurement gap pattern stated in clause 8.1.2.4 shall apply.

The reporting range and mapping specified for TDD P-CCPCH RSCP in TS 25.123 [19] shall apply.

9.3.2 Void

9.3.3 Void

9.4 GSM Measurements

The requirements in this clause are applicable for a UE:

- in state RRC CONNECTED
- performing measurements according to clause 8.1.2.4.5 with appropriate measurement gaps
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS 25.302 [6].

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

9.4.1 GSM carrier RSSI

NOTE: This measurement is for handover between E-UTRAN and GSM.

The requirements in this clause are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is specified in clause 8.1.2.4.5.

In RRC_CONNECTED state the measurement accuracy requirements for RXLEV in TS 45.008 [8] shall apply.

If the UE, in RRC_CONNECED state, needs measurement gaps to perform GSM measurements, the GSM measurement procedure and measurement gap pattern stated in clause 8.1.2.4.5 shall apply.

The reporting range and mapping specified for RXLEV in TS 45.008 [8] shall apply.

9.5 CDMA2000 1x RTT Measurements

The requirements in this clause are applicable for a UE:

- in RRC_CONNECTED state.
- synchronised to the cell that is measured.

9.5.1 CDMA2000 1x RTT Pilot Strength

NOTE: This measurement is for handover between E-UTRAN and cdma2000 1 x RTT.

The requirements in this clause are valid for terminals supporting this capability.

CDMA2000 1xRTT Pilot Strength defined in sub-clause 5.1.10 of [4] shall meet the performance requirement defined in sub-clause 3.2.4 of [14] on the cdma2000 1xRTT neighbour cells indicated by the serving eNode B.

$P_{CMAX,c}$

For a UE configured with a secondary cell, the UE is required to report the UE configured maximum output power $(P_{CMAX,c})$ together with the power headroom. This clause defines the requirements for the $P_{CMAX,c}$ reporting.

9.6.1 Report Mapping

The $P_{CMAX,c}$ reporting range is defined from -29dBm to 33 dBm with 1 dB resolution. Table 9.6.1-1 defines the reporting mapping.

Reported value Measured quantity value Unit PCMAX_C_00 $P_{CMAX,c} < -29$ dBm PCMAX_C_01 $-29 \le P_{CMAX,c} < -28$ dBm PCMAX C 02 $-28 \le P_{CMAX,c} < -27$ dBm PCMAX_C_61 $31 \le P_{CMAX,c} < 32$ dBm PCMAX_C_62 $32 \le P_{CMAX,c} < 33$ dBm $\overline{33} \leq P_{CMAX}$ PCMAX C 63 dBm

Table 9.6.1-1 Mapping of P_{CMAX,c}

9.6.2 Estimation Period

When *extendedPHR* is configured and UE is required to include $P_{CMAX,c}$ in Extended PHR MAC control element as defined in subclause 5.4.6 in [17], the UE shall calculate the $P_{CMAX,c}$ per activated serving cell c for UL-SCH transmission according to subclause 6.2.5A of TS 36.101 [5] over 1 subframe.

9.6.3 Reporting Delay

The $P_{CMAX,c}$ reporting delay is defined as the time between the beginning of the $P_{CMAX,c}$ reference period and the time when the UE starts transmitting $P_{CMAX,c}$ over the radio interface. The reporting delay of the $P_{CMAX,c}$ shall be 0 ms, which is applicable for all configured triggering mechanisms for $P_{CMAX,c}$ reporting.

9.7 IEEE802.11 Measurements

The requirements in this clause are applicable for a UE:

- in RRC_CONNECTED state.
- synchronised to the IEEE 802.11 access point that is measured.

9.7.1 WLAN RSSI

NOTE: This measurement is for access network selection and traffic steering between E-UTRAN and WLAN.

The requirements in this clause are valid for terminals supporting this capability.

WLAN RSSI defined in sub-clause 5.1.16 of [4] shall meet the performance requirement defined in [32].

9.7.2 WLAN RSSI Measurement Report Mapping

The reporting range of WLAN RSSI is defined from -100 dBm to 40 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.7.2-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.7.2-1: WLAN RSSI measurement report mapping

Reported value	Measured quantity value	Unit
WLAN RSSI_00	WLAN RSSI < -100	dBm
WLAN RSSI_01	-100 ≤ WLAN RSSI < -99	dBm
WLAN RSSI_02	-99 ≤ WLAN RSSI < -98	dBm
WLAN RSSI_139	38 ≤ WLAN RSSI < 39	dBm
WLAN RSSI_140	39 ≤ WLAN RSSI < 40	dBm
WLAN RSSI_141	40 ≤ WLAN RSSI	dBm

9.8 MBSFN Measurements

9.8.1 Introduction

MBSFN measurements include MBSFN RSRP, MBSFN RSRQ, and MCH BLER, which are defined in [4]. The measurements are used for MDT.

9.8.2 MBSFN RSRP

9.8.2.1 Absolute MBSFN RSRP measurement accuracy requirements

The requirements for absolute accuracy of MBSFN RSRP in this clause apply to any carrier, which may be the same as or different from any serving unicast carrier, where PMCH is received while meeting performance requirements in Section 10 of [5].

The accuracy requirements in Table 9.8.2.1-1 are valid under the following conditions:

MBSFN RS are transmitted from antenna port 4 in the MBSFN subframes where PMCH is received.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

MBSFN RSRP|dBm/15kHz is the same as RSRP|dBm/15kHz specified in Annex B.3.1 for each corresponding Band.

Table 9.8.2.1-1: Absolute MBSFN RSRP measurement accuracy

Accı	ıracy		C	onditions			
Normal	Extreme		lo Note 1 range				
condition	condition	Ês/lot	E-UTRA operating band groups ^{Note 3}	Minimum Io		Maximum lo	
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	N/A	-70	
		±9 ≥-6 dB	FDD_B	-120.5	N/A	-70	
			FDD_C, TDD_C	-120	N/A	-70	
			FDD_D	-119.5	N/A	-70	
±4.5	±9		FDD_E, TDD_E	-119	N/A	-70	
			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_H	-117.5	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50	
NOTE 1: Io is assumed to have constant EPRE across the bandwidth.							

NOTE 2: The condition level is increased by ∆>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

9.8.2.2 MBSFN RSRP measurement report mapping

The reporting range of MBSFN RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.8.2.2-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.8.2.2-1: MBSFN RSRP measurement report mapping

Reported value	Measured quantity value	Unit
MBSFN_RSRP_00	MBSFN_RSRP < -140	dBm
MBSFN_RSRP_01	-140 ≤ MBSFN_RSRP < -139	dBm
MBSFN_RSRP_02	-139 ≤ MBSFN_RSRP < -138	dBm
MBSFN_RSRP_95	-46 ≤ MBSFN_RSRP < -45	dBm
MBSFN_RSRP_96	-45 ≤ MBSFN_RSRP < -44	dBm
MBSFN_RSRP_97	-44 ≤ MBSFN_RSRP	dBm

9.8.3 MBSFN RSRQ

9.8.3.1 Absolute MBSFN RSRQ measurement accuracy requirements

The requirements for absolute accuracy of MBSFN RSRQ in this clause apply to any carrier, which may be the same as or different from a serving unicast carrier, where PMCH is received while meeting performance requirements in Section 10 of [5].

The accuracy requirements in Table 9.8.3.1-1 are valid under the following conditions:

MBSFN RS are transmitted from antenna port 4 in the MBSFN subframes where PMCH is received.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

MBSFN RSRP|dBm/15kHz is the same as RSRP|dBm/15kHz specified in Annex B.3.1 for each corresponding Band.

Table 9.8.3.1-1: Absolute MBSFN RSRQ measurement accuracy

Accı	Accuracy		Conditions			
Normal	Evtromo		Io Note 1 range			
Normal condition	Extreme condition	Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io	
dB	dB	dB		dBm/15kHz Note 3	dBm/BW _{Channel}	
			FDD_A, TDD_A	-121	-50	
	±4	-4 ≥-3 dB	FDD_B	-120.5	-50	
			FDD_C, TDD_C	-120	-50	
			FDD_D	-119.5	-50	
±2.5			FDD_E, TDD_E	-119	-50	
			FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
			FDD_N	-114.5	-50	
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.

NOTE 3: The condition level is increased by ∆>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

9.8.3.2 MBSFN RSRQ measurement report mapping

The reporting range of MBSFN RSRQ is defined from -23 dB to -7.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in Table 9.8.3.2-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.8.3.2-1: MBSFN RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
MBSFN_RSRQ_00	MBSFN_RSRQ < -23	dB
MBSFN_RSRQ_01	-23 ≤ MBSFN_RSRQ < -22.5	dB
MBSFN_RSRQ_02	-22.5 ≤ MBSFN_RSRQ < -22	dB
•••		•••
MBSFN_RSRQ_30	-8.5 ≤ MBSFN_RSRQ < -8	dB
MBSFN_RSRQ_31	-8 ≤ MBSFN_RSRQ	dB

9.8.4 MCH BLER

MCH BLER shall be measured as defined in [4].

9.8.4.1 Measurement report mapping for MCH BLER

The UE shall report MCH BLER together with the corresponding total number of MCH blocks, which were received by the UE during the MCH BLER measurement period and used for calculating the reported MCH BLER.

The reporting range of MCH BLER is defined from 0.1% to 50% with uniform quantization in log domain.

The mapping of measured quantity is defined in Table 9.8.4.1-1. The range in the signalling may be larger than the range specified in the table below.

Reported value Measured quantity value Unit MCH BLER_00 % MCH BLER < 0.1 MCH BLER_01 % 0.1≤ MCH BLER < 0.123 % MCH BLER_02 0.123 ≤ MCH BLER < 0.151 MCH BLER_03 0.151≤ MCH BLER < 0.186 % MCH BLER_04 % 0.186≤ MCH BLER < 0.229 % MCH BLER_05 0.229 SMCH BLER < 0.282 MCH BLER 06 0. 282≤ MCH BLER < 0.347 % MCH BLER_07 0. 347≤ MCH BLER <0.426 % MCH BLER_08 % 0. 426≤ MCH BLER <0.525 % MCH BLER_09 0. 525≤ MCH BLER < 0.645 MCH BLER_10 % 0. 645≤ MCH BLER < 0.794 MCH BLER_11 0. 794≤ MCH BLER <0.976 % MCH BLER_12 0. 976≤ MCH BLER <1.201 % MCH BLER_13 1. 201≤ MCH BLER <1.478 % MCH BLER 14 1. 478≤ MCH BLER <1.818 % MCH BLER_15 1. 818≤ MCH BLER <2.236 % MCH BLER_16 % 2. 236≤ MCH BLER <2.751 MCH BLER_17 % 2. 751 ≤ MCH BLER < 3.384 MCH BLER_18 % 3. 384≤ MCH BLER <4.163 MCH BLER_19 % 4.163≤ MCH BLER <5.121 % MCH BLER_20 5.121≤ MCH BLER <6.300 % MCH BLER_21 6.300≤ MCH BLER <7.750 MCH BLER 22 7.750≤ MCH BLER <9.533 % MCH BLER_23 % 9.533≤ MCH BLER <11.728 MCH BLER_24 % 11.728≤ MCH BLER <14.427 MCH BLER 25 14.427≤ MCH BLER <17.478 % MCH BLER_26 17.478≤ MCH BLER <21.833 % MCH BLER_27 21.833 MCH BLER < 26.858 % MCH BLER_28 % 26.858 MCH BLER < 33.040 MCH BLER_29 % 33.040≤ MCH BLER <40.645 MCH BLER_30 % 40.645≤ MCH BLER < 50 % MCH BLER_31 50 ≤ MCH BLER

Table 9.8.4.1-1: MCH BLER measurement report mapping

9.8.4.2 Measurement report mapping for MCH Block Number

The reporting range of the total number of received MCH blocks during the measurement period is defined from 0 to 65152. The total number of received MCH blocks is quantized to two values n and m with the mappings defined in Table 9.8.4.2-1 and Table 9.8.4.2-2, respectively.

The range in the signalling may be larger than the range specified in the table below.

 N_R in Table 9.8.4.2-1 and Table 9.8.4.2-2 represents the total number of received MCH blocks. $f(N_R)$ is a function of N_R with the definition that $f\left(N_R\right) = \frac{N_R - \left(2^n - 1\right) \times 2^8}{2^n}$, from where the quantized total number of MCH blocks is found as $\left(2^n - 1\right) \times 2^8 + m \times 2^n$.

Table 9.8.4.2-1: Number of received MCH blocks mapping to n

Reported value, n	Number of received MCH blocks
MCH_NR_N_00	$0 \le N_R < 256$
MCH_NR_N_01	256≤ N _R < 768
MCH_NR_N_02	768≤ N _R < 1792
MCH_NR_N_03	1792≤ N _R < 3840
MCH_NR_N_04	3840≤ N _R < 7936
MCH_NR_N_05	7936≤ N _R <16128
MCH_NR_N_06	16128≤ N _R < 32512
MCH_NR_N_07	32512≤ N _R

Table 9.8.4.2-2: Number of received MCH blocks mapping to m

Reported value, m	f(N _R)
MCH_NR_M_00	$0 \le f(N_R) < 1$
MCH_NR_M_01	$1 \le f(N_R) < 2$
MCH_NR_M_02	$2 \le f(N_R) < 3$
MCH_NR_M_253	$253 \le f(N_R) < 254$
MCH_NR_M_254	254≤ f(N _R) < 255
MCH_NR_M_255	255≤ f(N _R)

9.9 ProSe Measurements

9.9.1 Introduction

The requirements in this section are applicable for a UE capable of ProSe Direct Communication and/or ProSe Direct Discovery.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in [25].

The accuracy requirements in this clause are:

- applicable for AWGN radio propagation conditions,
- assume independent interference (noise) at each receiver antenna port.
- valid for the reported measurement result after layer 1 filtering,
- are verified from the measurement report at point D in the measurement model having the higher layer filtering disabled.

9.9.2 Intra-Frequency S-RSRP Measurement Accuracy Requirements

9.9.2.1 Absolute S-RSRP Accuracy

The requirements for absolute accuracy of S-RSRP in this clause apply to a ProSe synchronization source on the same frequency as that of the own ProSe UE performing the measurement.

The accuracy requirements in Table 9.9.2.1-1 are valid under the following conditions:

- Demodulation reference signals are transmitted from one port.
- Conditions defined in 36.101 Clause 7.3D for reference sensitivity are fulfilled.
- S-RSRP|dBm according to Annex B.5.1 for a corresponding Band are fulfilled.

Table 9.9.2.1-1: Intra-frequency S-RSRP absolute accuracy for UE capable of ProSe Direct Communication and/or ProSe Direct Discovery

Accuracy			C	Conditions			
Normal	Extreme	Ês/lot	lo Note 1 range				
condition	condition	Note 4	E-UTRA ProSe operating band groups Note 3 Minimum		num lo	Maximum lo	
dB	dB	dB		dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}	
		±9 ≥-6 dB	FDD_A	-121	N/A	-70	
			FDD_D	-119.5	N/A	-70	
145	±9		FDD_E, TDD_E	-119	N/A	-70	
±4.5			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±8	±11	≥-6 dB	FDD_A, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_N	N/A	-70	-50	

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 3: E-UTRA ProSe operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.
- NOTE 4: Ês/lot for a SyncRef UE is the minimum of the Ês/lot of PSSS/PSBCH and the Ês/lot of SSSS

9.9.2.2 Relative Accuracy of S-RSRP

The relative accuracy of S-RSRP is defined as the S-RSRP measured from one ProSe synchronization source compared to the S-RSRP measured from another ProSe synchronization source on the same frequency.

The accuracy requirements in Table 9.9.2.2-1 are valid under the following conditions:

- Demodulation reference signals are transmitted from one port.
- Conditions defined in 36.101 Clause 7.3D for reference sensitivity are fulfilled.
- S-RSRP1,2_{dBm} according to Annex B.5.2 for a corresponding Band.

Table 9.9.2.2-1: S-RSRP Intra frequency relative accuracy for UE capable of ProSe direct communication and/or ProSe Direct Discovery

Accuracy		Conditions				
Normal	Extreme condition	Ês/lot Note	lo ^{Note 1} range			
condition		2, 6	E-UTRA ProSe operating band groups Note 5	Minimum Io	Maximum lo	
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}	
	±3	≥-3 dB	FDD_A	-121	-50	
			FDD_D	-119.5	-50	
±2			FDD_E, TDD_E	-119	-50	
工乙			FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_N	-114.5	-50	
±3	±3	≥-6 dB	Note 3	Note 3	Note 3	

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The parameter Ês/lot is the minimum Ês/lot of the pair of SyncRef UEs to which the requirement applies.
- NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 4: The condition level is increased by ∆>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 5: E-UTRA ProSe operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.
- NOTE 6: És/lot for a SyncRef UE is the minimum of the Ês/lot of PSSS/PSBCH and the Ês/lot of SSSS

9.9.3 Intra-Frequency SD-RSRP Measurement Accuracy Requirements

The requirements in this clause are applicable for a remote ProSe UE:

- in state RRC_IDLE or RRC_CONNECTED if the frequency used for ProSe is the serving frequency, or
- is out of coverage on the frequency used for ProSe, and
- that is synchronised to the ProSe relay UE that is measured.

9.9.3.1 Absolute SD-RSRP Accuracy

The requirements for absolute accuracy of SD-RSRP in this clause apply to a ProSe UE performing SD-RSRP measurements on the same frequency as used by the ProSe relay UE transmitting the relay Discovery message.

The accuracy requirements in Table 9.9.3.1-1 are valid under the following conditions:

- Demodulation reference signals are transmitted from one port.
- Conditions defined in 36.101 Clause 7.3D for reference sensitivity are fulfilled.
- SD-RSRP|dBm according to Annex B.5.4 for a corresponding Band are fulfilled.
- numReTx is configured as 3 for the relay Discovery transmissions. For numReTx < 3, the minimum $\triangle s/N_{oc}$ at which the accuracy requirements are fulfilled is expected to be higher than as specified for numReTx=3.

Table 9.9.3.1-1: Intra-frequency SD-RSRP absolute accuracy for remote UE [2] capable of ProSe Direct Communication and ProSe Direct Discovery and configured by upper layers for relay operation.

Accuracy		Conditions				
Normal	Extreme	sytromo Êc/N	Io Note 1 range			
condition	condition	Ês/N _{oc} Note 4	E-UTRA ProSe operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB	•	dBm/15kHz Note 2	dBm/BW _{Channel}	dBm/BW _{Channel}
			FDD_D	-119.5	N/A	-70
		•	FDD_E	-119	N/A	-70
±4.5 ±9	±9	≥-1.5 dB	FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-1.5 dB	FDD_D, FDD_E, FDD_F, FDD_G, FDD_N	N/A	-70	-50

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 3: E-UTRA ProSe operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.
- NOTE 4: When *numReTx* is configured as 3 for the relay Discovery transmissions. For *numReTx* < 3, the minimum Ês/N_{oc} at which the accuracy requirements are fulfilled is expected to be higher than as specified for *numReTx*=3.
- NOTE 5: Layer 1 filtering for SD-RSRP is performed using PSDCH (re)transmissions within a discovery period.

9.9.3.2 Relative Accuracy of SD-RSRP

The relative accuracy of SD-RSRP in this clause apply to a ProSe UE performing SD-RSRP measurements on the same frequency as used by the ProSe relay UE transmitting the relay Discovery message.

The accuracy requirements in Table 9.9.3.2-1 are valid under the following conditions:

- Demodulation reference signals are transmitted from one port.

- Conditions defined in 36.101 Clause 7.3D for reference sensitivity are fulfilled.
- SD-RSRP|dBm according to Annex B.5.5 for a corresponding Band are fulfilled.
- numReTx is configured as 3 for the relay Discovery transmissions. For numReTx < 3, the minimum $\triangle S/N_{oc}$ at which the accuracy requirements are fulfilled is expected to be higher than as specified for numReTx=3.

Table 9.9.3.2-1: Intra-frequency SD-RSRP relative accuracy for remote UE [2] capable of ProSe Direct Communication and ProSe Direct Discovery and configured by upper layers for relay operation.

Accuracy		Conditions				
Normal	Extreme	Ês/N _{oc} Note	lo ^{Note 1} range			
condition			E-UTRA ProSe operating band groups Note 5	Minimum Io	Maximum lo	
dB	dB	dB		dBm/15kHz Note 4	dBm/BW _{Channel}	
			FDD_D	-119.5	-50	
		≥-1.5 dB	FDD_E	-119	-50	
±2	±3		FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_N	-114.5	-50	
±3	±3	≥-1.5 dB	Note 3	Note 3	Note 3	

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The parameter Ês/N_{oc} is the minimum Ês/N_{oc} of the pair of ProSe Relay UEs to which the requirement applies.
- NOTE 3: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 5: E-UTRA ProSe operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.
- NOTE 6: When *numReTx* is configured as 3 for the relay Discovery transmissions. For *numReTx* < 3, the minimum Ês/N_{oc} at which the accuracy requirements are fulfilled is expected to be higher than as specified for *numReTx*=3.
- NOTE 7: Layer 1 filtering for SD-RSRP is performed using PSDCH (re)transmissions within a discovery period.

10 Measurements Performance Requirements for E-UTRAN

10.1 Received Interference Power

The measurement period shall be 100 ms.

10.1.1 Absolute accuracy requirement

Table 10.1.1-1: Received Interference Power absolute accuracy

Parameter	Unit	Accuracy	Conditions
		[dB]	lob [dBm/180 kHz]
lob	dBm/180 kHz	± 4	-11796

10.1.2 Relative accuracy requirement

The relative accuracy is defined as the Received Interference Power measured at one frequency compared to the Received Interference Power measured from the same frequency at a different time.

Table 10.1.2-1: Received Interference Power relative accuracy

Parameter	Unit	Accuracy	Conditions
		[dB]	lob [dBm/180 kHz]
lob	dBm/180 kHz	± 0.5	-11796
			AND for changes ≤ ±9.0 dB

10.1.3 Received Interference Power measurement report mapping

The reporting range for Received Interference Power (RIP) is from -126 ... -75 dBm.

In table 10.2.3-1 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 10.1.3-1: Received Interference Power measurement reporting range

Reported value	Measured quantity value	Unit
RTWP_LEV _000	RIP < -126.0	dBm
RTWP_LEV _001	-126.0 ≤ RIP < -125.9	dBm
RTWP_LEV _002	-125.9 ≤ RIP < -125.8	dBm
RTWP_LEV _509	-75.2 ≤ RIP < -75.1	dBm
RTWP_LEV _510	-75.1 ≤ RIP < -75.0	dBm
RTWP_LEV _511	-75.0 ≤ RIP	dBm

10.2 Angle of Arrival (AOA)

10.2.1 Range/mapping

The reporting range for AOA measurement is from 0 to 360 degree, with resolution of 0.5 degree.

The mapping of the measured quantity is defined in table 10.2.1-1.

Table 10.2.1-1: AOA measurement report mapping

Reported value	Measured quantity value	Unit
AOA_ANGLE _000	0 ≤ AOA_ANGLE < 0.5	degree
AOA_ANGLE _001	0.5 ≤ AOA_ANGLE < 1	degree
AOA_ANGLE _002	1 ≤ AOA_ANGLE < 1.5	degree
	•••	
AOA_ANGLE _717	358.5 ≤ AOA_ANGLE < 359	degree
AOA_ANGLE _718	359 ≤ AOA_ANGLE < 359.5	degree
AOA_ANGLE _719	359.5 ≤ AOA_ANGLE < 360	degree

10.3 Timing Advance (T_{ADV})

10.3.1 Report mapping

The reporting range of T_{ADV} is defined from 0 to $49232T_s$ with $2T_s$ resolution for timing advance less or equal to $4096T_s$ and $8T_s$ for timing advance greater than $4096T_s$.

The mapping of measured quantity is defined in Table 10.3.1-1.

Table 10.3.1-1: T_{ADV} measurement report mapping

Reported value	Measured quantity value	Unit
TIME_ADVANCE_00	T _{ADV} < 2	Ts
TIME_ADVANCE_01	2 ≤ T _{ADV} < 4	Ts
TIME_ADVANCE_02	$4 \le T_{ADV} < 6$	Ts
		•••
TIME_ADVANCE_2046	$4092 \le T_{ADV} < 4094$	T _s
TIME_ADVANCE_2047	$4094 \le T_{ADV} < 4096$	Ts
TIME_ADVANCE_2048	$4096 \le T_{ADV} < 4104$	Ts
TIME_ADVANCE_2049	$4104 \le T_{ADV} < 4112$	Ts
•••		•••
TIME_ADVANCE_7688	$49216 \le T_{ADV} < 49224$	T_s
TIME_ADVANCE_7689	$49224 \le T_{ADV} < 49232$	Ts
TIME_ADVANCE_7690	$49232 \le T_{ADV}$	Ts

11 ProSe Requirements in Any Cell Selection state

11.1 Introduction

This section contains the requirements for the UE capable of ProSe Direct Communication and/or ProSe Direct Discovery when the UE is out of coverage on the carrier used for ProSe operation, as defined in [1]. The ProSe requirements shall apply provided that the sidelink used by the UE for ProSe Direct Communication and/or ProSe Direct Discovery is on the carrier that is preconfigured in the ProSe UE for out-of-coverage operation. The requirement apply when the UE is:

- in any cell selection state, or,
- out of coverage on the ProSe carrier and is associated with a serving cell on a non-ProSe carrier.

Note: Any cell selection state refers to a UE that is out of network coverage and is not associated with a serving cell on any carrier [1].

11.2 UE Transmit Timing for ProSe in Any Cell Selection State

11.2.1 Introduction

This clause contains requirements on the UE capable of ProSe Direct Communication and/or ProSe Direct Discovery regarding transmit timing if the UE is out of coverage on the carrier used for ProSe operation.

11.2.2 ProSe UE transmission timing

The requirements in this subclause are applicable when the reference timing used for deriving ProSe transmission is from another ProSe UE transmitting sidelink synchronization signals.

The sidelink transmissions takes place $(N_{\rm TA,SL} + N_{\rm TA\,offset}) \cdot T_{\rm s}$ before the reception of the first detected path (in time) of the corresponding timing reference frame from the UE, with $N_{\rm TA\,offset} = 0$ and $N_{\rm TA,SL} = 0$ [16]. The transmission timing error for sidelink transmissions shall be less than or equal to $\pm T_{\rm e}$ where the timing error limit value $T_{\rm e}$ is specified in Table 11.2.2-1.

Table 11.2.2-1: T_e Timing Error Limit

Sidel	ink Bandwidth (MHz)	T _e
≥1.4		24*T _S
Note: T _S is the basic timing un		it defined in TS 36.211

11.3 Initiation/Cease of SLSS Transmissions

11.3.1 Introduction

The requirements in this subclause apply when the conditions for SLSS transmissions specified in [2] are met and if *syncTxThreshOoC* is included in the preconfigured ProSe parameters.

11.3.2 Requirements

The UE shall be capable of measuring the S-RSRP of the selected SyncRef UE used to derive transmission timing for Prose Direct Communication and/or ProSe Direct Discovery and evaluate it to initiate/cease SLSS transmissions within $T_{\text{evaluate,SLSS}} = 0.8$ seconds.

If higher layer filtering for S-RSRP measurements is pre-configured, an additional delay in evaluation to initiate/cease SLSS transmissions can be expected.

For the selected SyncRef UE [2] used to derive transmission timing for ProSe Direct Communication and/or ProSe Direct Discovery:

- S-RSRP related side conditions given in Section 11.5 for a corresponding Band are fulfilled,
- ProSe SCH_RP and SCH Ês/Iot according to Annex B.5.1 for a corresponding Band are fulfilled.

11.4 Measurements for ProSe in Any Cell Selection State

11.4.1 Introduction

This clause contains requirements for E-UTRA cell identification for the UE capable of ProSe Direct Communication and/or ProSe Direct Discovery if the UE is out of coverage on the carrier used for ProSe operation.

The UE can be preconfigured with ProSe resources for out of coverage ProSe operation.

The requirements in this section are applicable for the ProSe if the UE is out of coverage on the carrier used for ProSe operation using the preconfigured ProSe resources. The ProSe UE shall:

- continuously search for any detectable E-UTRA cell on the donwlink carrier frequency associated with the preconfigured ProSe carrier frequency for out of coverage ProSe operation, and
- if in any cell selection state, then search cells also on other carriers and perform cell selection according to the procedure specified in section 4.1.

11.4.2 Requirements

11.4.2.1 E-UTRA FDD

The requirements in this subclause are applicable when the preconfigured ProSe carrier is FDD (parameter *tdd-ConfigSL* is configured as *none*).

The UE capable of ProSe Direct Communication and/or ProSe Direct Discovery immediately upon being out of coverage on the ProSe carrier shall search for any detectable cell on the carrier preconfigured with ProSe resources.

The UE shall be able to identify a newly detectable E-UTRA FDD cell on the downlink carrier frequency associated with the preconfigured with ProSe carrier frequency:

- within $T_{basic_identify_OoC_ProSe\ Tx_ON}$ if the UE is performing ProSe transmissions on the sidelink, or
- within $T_{basic_identify_OoC_ProSe\ Tx_OFF}$ if the UE is not performing ProSe transmissions on the sidelink.

where.

T_{basic identify OoC ProSe Tx ON} = 6.4 seconds, and

 $T_{basic\ identify\ OoC\ ProSe\ Tx\ OFF} = 32\ seconds.$

An E-UTRA cell is considered detectable provided it meets the intra-frequency cell identification conditions specified in section 8.1.2.2.

11.4.2.2 E-UTRA TDD

The requirements in this subclause are applicable when the preconfigured ProSe carrier is configured as TDD.

The UE capable of ProSe Direct Discovery immediately upon being out of coverage on the ProSe carrier shall search for any detectable cell on the carrier preconfigured with ProSe resources.

The UE shall be able to identify a newly detectable E-UTRA TDD cell on TDD carrier frequency preconfigured for ProSe operation:

- within T_{basic_identify_OoC_ProSe Tx_ON} if the UE is performing ProSe transmissions on the sidelink, or
- within $T_{basic_identify_OoC_ProSe\ Tx_OFF}$ if the UE is not performing ProSe transmissions on the sidelink.

where,

T_{basic identify OoC ProSe Tx ON} = 6.4 seconds, and

 $T_{basic_identify_OoC_ProSe\ Tx_OFF} = 32\ seconds.$

An E-UTRA cell is considered detectable provided it meets the intra-frequency cell identification conditions specified in section 8.1.2.2.

The UE shall be allowed to interrupt ProSe Direct Discovery operation in order to meet the requirements in this subclause.

11.5 Selection / Reselection of ProSe Synchronization Reference

11.5.1 Introduction

This clause contains requirements for the measurements performed by the UE capable of ProSe Direct Communication and/or ProSe Direct Discovery if the UE is out of coverage on the carrier used for ProSe operation.

11.5.2 Selection/Reselection to intra-frequency SyncRef UE

11.5.2.1 Introduction

This clause contains requirements for the measurement for the ProSe synchronization on the UE capable of ProSe Direct Communication and/or ProSe Direct Discovery if the UE is out of coverage on the carrier used for ProSe operation.

11.5.2.2 Requirements

The UE shall be able to identify newly detectable SyncRef UE within $T_{\text{detect,SyncRef UE}}$ seconds if SyncRef UE meets the selection / reselection criterion defined in TS 36.331 [2].

ProSe synchronization source, SyncRef UE, is defined as a ProSe synchronization source which is capable to transmit ProSe synchronization signals.

A SyncRef UE is considered to be detectable when

- S-RSRP related side conditions given in Section 9.9.2 are fulfilled for a corresponding Band,
- ProSe SCH_RP and SCH Ês/Iot are fulfilled according to Annex B.5.3 for a corresponding Band.

 $T_{\text{detect,SyncRef UE}}$ is defined as 20 seconds at SCH Es/Iot \geq -4 dB, provided that the ProSe UE is allowed to drop a maximum of 2% of its ProSe Direct Communication and ProSe Direct Discovery transmissions at the physical layer for the purpose of SyncRef UE selection / reselection.

The UE capable of ProSe Direct Communication and/or ProSe Direct Discovery shall be capable of performing S-RSRP measurements for 6 identified ProSe synchronization sources with the measurement period of 400 ms. It is assumed that the ProSe synchronization sources do not drop or delay more than one SLSS transmission within the measurement period. Otherwise, the measurement period may be extended.

11.6 Void

11.7 Selection / Reselection of ProSe relay UE

11.7.1 Introduction

This section contains the requirements related to selection and reselection of ProSe relay UE when the remote UE is out of coverage on the frequency used for ProSe Direct Communication.

The requirements apply for the selection and reselection of candidate relay UEs that are transmitting relay discovery signals within the discovery resource pool as configured for the remote UE, and follow a synchronization source that either the same or is synchronized to the one use by remote UE.

11.7.2 Selection / Reselection of intra-frequency ProSe relay UE

For a remote UE configured by upper layer for relay operation, the remote UE shall search for candidate relay UEs for selection and/or reselection every discovery period.

If the remote UE has a selected sidelink relay UE, then the remote UE shall measure the SD-RSRP of the selected relay once in every four discovery periods and evaluate if it meets the relay selection criterion as defined in [TS 36.331, 5.10.11.4].

The remote UE shall measure SD-RSRP of the candidate relay UEs every $T_{measure, ProSe_Relay_Intra}$ for intra-frequency relay UEs that are detected and measured according to the measurement rules.

For an intra-frequency relay UEs that are detected, but that has not been selected or reselected to, the remote UE shall be capable of evaluating that the intra-frequency relay UE has met selection or reselection criterion defined in [2, 5.10.11.4] within $T_{\text{evaluate,ProSe_Relay_Intra}}$ as specified in table 11.7.2-1.

The minimum requirements are required to meet when the selected and candidate relay UEs are transmitting relay discovery message every discovery period.

Table 11.7.2-1: T_{measure, ProSe_Relay_Intra} and T_{evaluate, ProSe_Relay_intra}

	Discovery Period [s]	T _{measure,ProSe_Relay_Intra} [s] (number of discovery periods)	T _{evaluate, ProSe_Relay_intra} [s] (number of discovery periods)					
	0.04≤Discovery period≤10.24	Note 1 (4)	Note 1 (16)					
١	NOTE 1: Time depends upon the configured Discovery period.							

Annex A (normative): Test Cases

A.1 Purpose of annex

This Annex specifies test specific parameters for some of the functional requirements in sections 4 to 9. The tests provide additional information to how the requirements should be interpreted for the purpose of conformance testing. The tests in this Annex are described such that one functional requirement may be tested in one or several test and one test may verify several requirements. Some requirements may lack a test.

The conformance tests are specified in TS 36.521-3 [23]. Statistical interpretation of the requirements is described in Annex A.2.

A.2 Requirement classification for statistical testing

Requirements in this specification are either expressed as absolute requirements with a single value stating the requirement, or expressed as a success rate. There are no provisions for the statistical variations that will occur when the parameter is tested.

Annex A outlines the tests in more detail and lists the test parameters needed. The test will result in an outcome of a test variable value for the device under test (DUT) inside or outside the test limit. Overall, the probability of a "good" DUT being inside the test limit(s) and the probability of a "bad" DUT being outside the test limit(s) should be as high as possible. For this reason, when selecting the test variable and the test limit(s), the statistical nature of the test is accounted for.

The statistical nature depends on the type of requirement. Some have large statistical variations, while others are not statistical in nature at all. When testing a parameter with a statistical nature, a confidence level is set. This establishes the probability that a DUT passing the test actually meets the requirements and determines how many times a test has to be repeated and what the pass and fail criteria are. Those aspects are not covered by TS 36.133. The details of the tests on how many times to run it and how to establish confidence in the tests are described in TS 36.521-3 [23]. This Annex establishes the variable to be used in the test and whether it can be viewed as statistical in nature or not.

A.2.1 Types of requirements in TS 36.133

A.2.1.1 Time and delay requirements on UE higher layer actions

A very large part of the RRM requirements are delay requirements:

- In E-UTRAN RRC_IDLE state mobility (clause A.4) there is cell re-selection delay.
- In E-UTRAN RRC_CONNECTED state mobility (clauses A.5 and A.8) there is handover delay, cell search delay and measurement reporting delay.
- In RRC Connection Control (clause A.6) there is RRC re-establishment delay.

All have in common that the UE is required to perform an action observable in higher layers (e.g. camp on the correct cell) within a certain time after a specific event (e.g. when a new strong pilot or reference signal appears). The delay time is statistical in nature for several reasons, among others that several of the measurements are performed by the UE in a fading radio environment.

The variations make a strict limit unsuitable for a test. Instead there is a condition set for a correct action by the UE, e.g. that the UE shall camp on the correct cell within X seconds. Then the rate of correct events is observed during repeated tests and a limit is set on the rate of correct events, usually 90% correct events are required. How the limit is applied in the test depends on the confidence required, further detailed are in TS 36.521-3 [23].

A.2.1.2 Measurements of power levels, relative powers and time

A very large number of requirements are on measurements that the UE performs:

- In E-UTRAN RRC_CONNECTED state mobility (clause A.5) there are measurement reports.
- In Measurement Performance Requirements (clause A.9) there are requirements for all type of measurements.

The accuracy requirements on measurements are expressed in this specification as a fixed limit (e.g. \pm /-X dB), but the measurement error will have a distribution that is not easily confined in fixed limits. Assuming a Gaussian distribution of the error, the limits will have to be set at \pm /-3.29 σ if the probability of failing a "good DUT" in a single test is to be kept at 0.1%. It is more reasonable to set the limit tighter and test the DUT by counting the rate of measurements that are within the limits, in a way similar to the requirements on delay.

A.2.1.3 Implementation requirements

A few requirements are strict actions the UE should take or capabilities the UE should have, without any allowance for deviations. These requirements are absolute and should be tested as such. Examples are:

- "Event triggered report rate" in E-UTRAN RRC_CONNECTED state mobility (clauses A.5 and A.8)
- "Correct behaviour at time-out" in RRC connection control (clause A.6)

A.2.1.4 Physical layer timing requirements

There are requirements on Timing and Signaling Characteristics (clauses A.7). There are both absolute and relative limits on timing accuracy depending upon the type of requirement. Examples are:

- Initial Transmit Timing (clause A.7.1) has an absolute limit on timing accuracy.
- Timing Advance (clause A.7.2) has a relative limit on timing accuracy.

A.3 RRM test configurations

A.3.1 Reference Measurement Channels

A.3.1.1 PDSCH

A.3.1.1.1 FDD

Table A.3.1.1.1-1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit					Value				
Reference channel		R.2		R.5	R.7	R.0	R.1	R.3	R.4	R.6
		FDD		FDD	FDD	FDD	FDD	FDD	FDD	FDD
Channel bandwidth	MHz	1.4	3	5	5	10	10	10	20	20
Number of transmitter antennas		1		1	1	1	2	1	1	1
Allocated resource blocks (Note 4)		2		11	11	24	24	24	24	24
Allocated subframes per Radio Frame		10		10	10	10	10	10	10	10
Modulation		QPS		QPS	QPS	QPS	QPS	QPS	QPS	QPS
		K		K	K	K	K	K	K	K
Target Coding Rate		1/3		1/3	1/3	1/3	1/3	1/3	1/3	1/3
Information Bit Payload										
For Sub-Frames 4, 9	Bits	120		968	968	2088	2088	2088	2088	2088
For Sub-Frame 5	Bits	104		776	776	2088	1736	2088	2088	2088
For Sub-Frame 0	Bits	32		616	616	1736	1736	1736	1736	1736
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0		0	968	0	0	2088	0	2088
Number of Code Blocks per Sub-Frame										
(Note 5)										
For Sub-Frames 4, 9		1		1	1	1	1	1	1	1
For Sub-Frame 5		1		1	1	1	1	1	1	1
For Sub-Frame 0		1		1	1	1	1	1	1	1
For Sub-Frame 1, 2, 3, 6, 7, 8		0		0	1	0	0	1	0	1
Binary Channel Bits Per Sub-Frame										
For Sub-Frames 4, 9	Bits	456		2772	2772	6624	6336	6624	6624	6624
For Sub-Frame 5	Bits	360		2484	2484	6336	6048	6336	6336	6336
For Sub-Frame 0	Bits	176		1932	1932	5784	5520	5784	5784	5784
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0		0	2772	0	0	6624	0	6624
Max. Throughput averaged over 1	kbps	37.6		332.8	913.6	800	765	2053	800	2053
frame										

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.

Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [16].

Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [3].

Note 4: Allocation is located in the middle of bandwidth.

Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)

Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.3.1.1.2 TDD

Table A.3.1.1.2-1: PDSCH Reference Measurement Channels for TDD UL/DL configuration1

Parameter	Unit			Va	alue		
Reference channel		R.2		R.4	R.0	R.1	R.3
		TDD		TDD	TDD	TDD	TDD
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas		1		1	1	2	1
Allocated resource blocks (Note 4)		2		11	24	24	24
Uplink-Downlink Configuration (Note 5)		1		1	1	1	1
Special Subframe Configuration (Note 6)		6		6	6	6	6
Allocated subframes per Radio Frame		6		6	6	6	6
Modulation		QPSK		QPSK	QPSK	QPSK	QPSK
Target Coding Rate		1/3		1/3	1/3	1/3	1/3
Information Bit Payload							
For Sub-Frames 4,9	Bits	120		968	2088	2088	2088
For Sub-Frame 5	Bits	104		968	2088	2088	2088
For Sub-Frame 0	Bits	56		616	2088	1736	2088
For Sub-Frame 1, 6 (DwPTS)	Bits	56		472	1032	1032	1032
Number of Code Blocks per Sub-Frame		1		1	1	1	1
(Note 7)							
For Sub-Frames 4,9		1		1	1	1	1
For Sub-Frame 5		1		1	1	1	1
For Sub-Frame 0		1		1	1	1	1
For Sub-Frame 1, 6 (DwPTS)		1		1	1	1	1
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4,9	Bits	456		2772	6624	6336	6624
For Sub-Frame 5	Bits	408		2628	6480	6192	6480
For Sub-Frame 0	Bits	224		2076	5928	5664	5928
For Sub-Frame 1, 6 (DwPTS)	Bits	272		1616	3696	3504	3696
Max. Throughput averaged over 1 frame	Mbps	0.051		0.446	1.041	1.006	1.0416
		2		4	6	4	

- Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
- Note 2: Reference signal, synchronization signals and PBCH allocated as defined in TS 36.211 [16].
- Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in TS 36.213 [3].
- Note 4: Allocation is located in the middle of bandwidth.
- Note 5: As per Table 4.2-2 in TS 36.211 [16]
- Note 6: As per Table 4.2-1 in TS 36.211 [16]
- Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
- Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

Table A.3.1.1.2-2: PDSCH Reference Measurement Channels for TDD UL/DL configuration0

Parameter	Unit			٧	alue		
Reference channel					R.5		
					TDD		
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas					1		
Allocated resource blocks (Note 4)					24		
Uplink-Downlink Configuration (Note 5)					0		
Special Subframe Configuration (Note 6)					6		
Allocated subframes per Radio Frame					4		
Modulation					QPSK		
Target Coding Rate					1/3		
Information Bit Payload							
For Sub-Frames 4,9	Bits				N/A		
For Sub-Frame 5	Bits				2088		
For Sub-Frame 0	Bits				2088		
For Sub-Frame 1, 6 (DwPTS)	Bits				1032		
Number of Code Blocks per Sub-Frame					1		
(Note 7)							
For Sub-Frames 4,9					N/A		
For Sub-Frame 5					1		
For Sub-Frame 0					1		
For Sub-Frame 1, 6 (DwPTS)					1		
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4,9	Bits				N/A		
For Sub-Frame 5	Bits				6480		
For Sub-Frame 0	Bits				5928		
For Sub-Frame 1, 6 (DwPTS)	Bits				3696		
Max. Throughput averaged over 1 frame	Mbps				0.624		

- 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for Note 1: 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
- Note 2: Reference signal, synchronization signals and PBCH allocated as defined in TS 36.211 [16].
- Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in TS 36.213 [3].
- Allocation is located in the middle of bandwidth. Note 4:
- Note 5:
- As per Table 4.2-2 in TS 36.211 [16] As per Table 4.2-1 in TS 36.211 [16] Note 6:
- If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to Note 7: each Code Block (otherwise L = 0 Bit)
- Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.3.1.1.3 FDD for UE category 0

Table A.3.1.1.3-1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit	Value					
Reference channel		R.13 FDD	R.14 FDD	R.15 FDD			
Channel bandwidth	MHz	10	10	10			
Number of transmitter antennas		1	2	2			
Allocated resource blocks (Note 4)		24	24	24			
Allocated subframes per Radio Frame		10	10	10			
Modulation		QPSK	QPSK	QPSK			
Target Coding Rate		1/10	1/10	1/10			
Information Bit Payload							
For Sub-Frames 4, 9	Bits	648	648	648			
For Sub-Frame 5	Bits	648	648	648			
For Sub-Frame 0	Bits	648	648	648			
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0	648			
Number of Code Blocks per Sub-Frame							
(Note 5)							
For Sub-Frames 4, 9		1	1	1			
For Sub-Frame 5		1	1	1			
For Sub-Frame 0		1	1	1			
For Sub-Frame 1, 2, 3, 6, 7, 8		1	1	1			
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4, 9	Bits	6624	6336	6636			
For Sub-Frame 5	Bits	6336	6048	6408			
For Sub-Frame 0	Bits	5784	5520	5520			
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0	6636			
Max. Throughput averaged over 1 frame	kbps	259.2	259.2	648			

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.

Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [16].

Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [3].

Note 4: Allocation is located in the middle of bandwidth.

Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)

Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.3.1.1.4 HD-FDD for UE category 0

Table A.3.1.1.4-1: PDSCH Reference Measurement Channels for HD-FDD

Parameter	Unit		Value
Reference channel		R.1 HD-FDD	R.2 HD-FDD
Channel bandwidth	MHz	10	10
Number of transmitter antennas		1	2
Allocated resource blocks (Note 4)		24	24
Allocated subframes per Radio Frame		10	10
Modulation		QPSK	QPSK
Target Coding Rate		1/10	1/10
Information Bit Payload			
For Sub-Frames 4, 9,	Bits	0	0
For Sub-Frame 5 (Note 7)	Bits	424	424
For Sub-Frame 0 (Note 7)		648	648
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0
For Sub-Frame 1, 6	Bits		
Number of Code Blocks per Sub-Frame			
(Note 5)			
For Sub-Frames 4, 9		1	1
For Sub-Frame 5		1	1
For Sub-Frame 0		1	1
For Sub-Frame 1, 2, 3, 6, 7, 8		1	1
Binary Channel Bits Per Sub-Frame			
For Sub-Frames 4, 9	Bits	0	0
For Sub-Frame 5	Bits	6336	6048
For Sub-Frame 0	Bits	5784	5520
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0
Max. Throughput averaged over 1 frame	kbps		

- Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.
- Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [16].
- Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [3].
- Note 4: Allocation is located in the middle of bandwidth.
- Note 5: If more than one Code Block is present, an additional CRC sequence of L=24 Bits is attached to each Code Block (otherwise L=0 Bit)
- Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.
- Note 7: Sub-frame 0 or sub-frame 5 is randomly scheduled in downlink.

A.3.1.1.5 TDD for UE category 0

Table A.3.1.1.5-1: PDSCH Reference Measurement Channels for TDD UL/DL configuration1

Parameter	Unit	Value		
Reference channel		R.12 TDD	R.13 TDD	
Channel bandwidth	MHz	10	10	
Number of transmitter antennas		1	2	
Allocated resource blocks (Note 4)		24	24	
Uplink-Downlink Configuration (Note 5)		1	1	
Special Subframe Configuration (Note 6)		6	6	
Allocated subframes per Radio Frame		6	6	
Modulation		QPSK	QPSK	
Target Coding Rate		1/10	1/10	
Information Bit Payload				
For Sub-Frames 4,9	Bits	648	648	
For Sub-Frame 5	Bits	648	648	
For Sub-Frame 0	Bits	648	648	
For Sub-Frame 1, 6 (DwPTS)	Bits	488	488	
Number of Code Blocks per Sub-Frame		1	1	
(Note 7)				
For Sub-Frames 4,9		1	1	
For Sub-Frame 5		1	1	
For Sub-Frame 0		1	1	
For Sub-Frame 1, 6 (DwPTS)		1	1	
Binary Channel Bits Per Sub-Frame				
For Sub-Frames 4,9	Bits	6624	6336	
For Sub-Frame 5	Bits	6580	6192	
For Sub-Frame 0	Bits	5928	5664	
For Sub-Frame 1, 6 (DwPTS)	Bits	3696	3408	
Max. Throughput averaged over 1 frame	Mbps	0.3552	0.3552	

- Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
- Note 2: Reference signal, synchronization signals and PBCH allocated as defined in TS 36.211 [16].
- Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in TS 36.213 [3].
- Note 4: Allocation is located in the middle of bandwidth.
- Note 5: As per Table 4.2-2 in TS 36.211 [16]
- Note 6: As per Table 4.2-1 in TS 36.211 [16]
- Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
- Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.3.1.2 PCFICH/PDCCH/PHICH

A.3.1.2.1 **FDD**

Table A.3.1.2.1-1: PCFICH/PDCCH/PHICH Reference Channel for FDD

Parameter	Unit	Value							
Reference channel		R.8 FDD	R.11	R.12	R.10	R.13	R.6	R.7	R.9
			FDD						
Channel bandwidth	MHz	1.4	5	5	20	20	10	10	10
Number of transmitter antennas		1	1	2	1	2	1	2	2
Control region OFDM symbols Note1	symbols	4	3	3	2	2	2	2	3
Aggregation level	CCE	2	8	8	8	8	8	8	8
		(Note 6)							
DCI Format		Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3
Cell ID		Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4
Payload (without CRC)	Bits	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5

Note 1: The control region consists of PCFICH, PHICH and PDCCH. Note 2: DCl formats are defined in TS 36.212.

Note 3: DCI format shall depend upon the test configuration.

Note 4: Cell ID shall depend upon the test configuration.

Note 5: Payload size shall depend upon the test configuration.

Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.

A.3.1.2.2TDD

Table A.3.1.2.2-1: PCFICH/PDCCH/PHICH Reference Channel for TDD

Parameter	Unit				Valu	ıe			
Reference channel		R.8 TDD	R.11	R.12	R.10	R.13	R.6	R.7	R.9
			TDD	TDD	TDD	TDD	TDD	TDD	TDD
Channel bandwidth	MHz	1.4	5	5	20	20	10	10	10
Number of transmitter antennas		1	1	2	1	2	1	2	2
Control region OFDM symbols Note1	symbols	4	3	3	2	2	2	2	3
		(Note 6)							
Aggregation level	CCE	2	8	8	8	8	8	8	8
		(Note 7)							
DCI Format		Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3
Cell ID		Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4
Payload (without CRC)	Bits	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5
Note 1: The con	trol region co	nsists of PC	FICH, PH	ICH and F	DCCH.				
Note 2: DCI form	nats are defin	ned in TS 36.	.212.						
Note 3: DCI form	nat shall depe	end upon the	test conf	iguration.					
	hall depend								
Note 5: Payload size shall depend upon the test configuration.									
	FDM symbo								
Note 7: For PDC	CH using SI	/RA/P-RNTI,	Aggregat	ion level 4	l is used.				

A.3.1.2.3 HD-FDD for UE category 0

Table A.3.1.2.3-1: PCFICH/PDCCH/PHICH Reference Channel for HD-FDD

Parameter	Unit	Value				
Reference channel		R.3 HD-FDD	R.4 HD-FDD	R.5 HD-FDD		
Channel bandwidth	MHz	10	10	10		
Number of transmitter antennas		1	2	2		
Control region OFDM symbols Note1	symbols	2	2	3		
Aggregation level	CCE	8	8	8		
DCI Format		Note 3	Note 3	Note 3		
Cell ID		Note 4	Note 4	Note 4		
Payload (without CRC)	Bits	Note 5	Note 5	Note 5		

Note 1: The control region consists of PCFICH, PHICH and PDCCH.

Note 2: DCI formats are defined in TS 36.212.

Note 3: DCI format shall depend upon the test configuration.

Note 4: Cell ID shall depend upon the test configuration.

Note 5: Payload size shall depend upon the test configuration.

Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.

Note 7: Sub-frame 0 or sub-frame 5 is randomly scheduled in downlink.

A.3.2 OFDMA Channel Noise Generator (OCNG)

A.3.2.1 OCNG Patterns for FDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test) and/or allocations used for MBSFN. The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols without and with reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i RA/OCNG_RA = PDSCH_i RB/OCNG_RB$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a constant transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. The number of PDCCH OFDM symbols in the non-MBSFN subframes is the same as specified in the RMC used in the test. The number of PDCCH OFDM symbols in the MBSFN subframe is the maximal allowed according to TS 36.213 [16]. For any aggregation and PHICH allocation, the PDCCH and any unused PHICH groups are padded with resource element groups with a power level given by PDCCH_RA/RB and PHICH_RA/RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

For subframes configured as PRS subframes the PDSCH allocation defined in the OCNG pattern does not apply.

For subframes configured as ABS subframes the PDSCH and PMCH allocation defined in the OCNG pattern does not apply.

The system information is scheduled in the allocations reserved for the OCNG patterns, in the subframes not configured for MBSFN. For this purpose the number of the RB-s allocated with PDSCH defined in the OCNG pattern can be reduced as necessary.

A.3.2.1.1 OCNG FDD pattern 1: outer resource blocks allocation in 10 MHz

Table A.3.2.1.1-1: OP.1 FDD: OCNG FDD Pattern 1

Allocation	Re	Relative power level $\gamma_{\it PRB}$ [dB]								
$n_{\it PRB}$		Subframe								
	0	5	4,9	1-3, 6-8						
0 – 12	0	0	0	N/A	Note 1	N/A				
37 – 49	0	0	0	N/A	Note	IN/A				
0-49	N/A	N/A	N/A	Note 4	N/A	Note 2				

- Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.
- Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.
- Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

A.3.2.1.2 OCNG FDD pattern 2: full bandwidth allocation in 10 MHz

Table A.3.2.1.2-1: OP.2 FDD: OCNG FDD Pattern 2

Allocation	Re	lative power I	evel $\gamma_{\it PRB}$ [c	IB]	PDSCH Data	PMCH Data
$n_{\it PRB}$		Dutu	Data			
	0	5	4, 9	1 - 3, 6 - 8		

0 – 49	0	0	0	N/A	Note 1	N/A
0 – 49	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

A.3.2.1.3 OCNG FDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table A.3.2.1.3-1: OP.3 FDD: OCNG FDD Pattern 3

Allocation	Re	Relative power level $\gamma_{\it PRB}$ [dB]						
$n_{\it PRB}$		Subframe						
	0	5	4,9	1-3, 6-8				
0 – 1	0	0	0	N/A	Note 1	N/A		
4 – 5	0	0	0	N/A	NOLE	IN/A		
	Ŭ	Ů	Ŭ	14// (
0 – 5	N/A	N/A	N/A	Note 4	N/A	Note 2		

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

A.3.2.1.4 OCNG FDD pattern 4: full bandwidth allocation in 1.4 MHz

Table A.3.2.1.4-1: OP.4 FDD: OCNG FDD Pattern 4

Allocation	Re	Relative power level $\gamma_{\it PRB}$ [dB]					
$n_{\it PRB}$		Data	Data				
	0	5	4, 9	1 – 3, 6 – 8			
0 – 5	0	0	0	N/A	Note 1	N/A	
0 – 5	N/A	N/A	N/A	Note 4	N/A	Note 2	

- Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.
- Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.
- Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

N/A:

Not Applicable

A.3.2.1.5 OCNG FDD pattern 5: outer resource blocks allocation in 10 MHz (without MBSFN)

Table A.3.2.1.5-1: OP.5 FDD: OCNG FDD Pattern 5

Allocation		Re	Relative power level $\gamma_{\it PRB}$ [dB]					
n_P	RB		Subframe	(Note 1)		Data		
		0	5	4,9	1-3, 6-8			
0 – 12		0	0	0	N/A			
37 – 49		0	0	0	N/A	Note 2		
0 –	49	N/A	N/A	N/A	0			
Note 1: Note 2:	subfram These p virtual U OCNG F	cation of any Ples not configure hysical resources with one PDSCHs shall be	ed as PRS sub e blocks are as SCH per virtus e uncorrelated	oframes. ssigned to an a al UE; the data d pseudo rando	arbitrary numb a transmitted o om data, which	er of over the n is		
Note 3:	PDSCH. If two or part of C antenna	more transmit a DCNG shall be to s with CRS and	antennas with ransmitted to t according to	CRS are used the virtual user the antenna tra	in the test, the s by all the tra ansmission mo	e PDSCH insmit ode 2.		
The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.								

OCNG FDD pattern 6: full bandwidth allocation in 10 MHz (without MBSFN) A.3.2.1.6

Table A.3.2.1.6-1: OP.6 FDD: OCNG FDD Pattern 6

Alloca	ation	Re	lative power I	evel $\gamma_{\it PRB}$ [d	B]	PDSCH Data	
n_{P}	RB		Subframe	(Note 1)		Data	
		0	5	4, 9	1 - 3, 6 - 8		
0 – 49		0	0	0	0	Note 2	
Note 1: Note 2:	The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes. These physical resource blocks are assigned to an arbitrary number virtual UEs with one PDSCH per virtual UE; the data transmitted ov OCNG PDSCHs shall be uncorrelated pseudo random data, which						
	QPSK m	nodulated. The l	parameter $\gamma_{\scriptscriptstyle F}$	$_{PRB}$ is used to s	scale the powe	er of	
Note 3:	If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission						
	mode 2.	The parameter	$\gamma_{\it PRB}$ applies	to each anten	na port separa	ately, so	
N/A:	the transmit power of the PDSCH part of OCNG is equal between transmit antennas with CRS used in the test. The antenna transmit modes are specified in clause 7.1 in TS 36.213.						

PDSCH

Data

(1-3, 6-8)^{Note}

Allocation

 n_{PRB}

N/A:

Not Applicable

A.3.2.1.7 OCNG FDD pattern 7: full bandwidth allocation in 1.4 MHz (without MBSFN)

Table A.3.2.1.8-1: OP.7 FDD: OCNG FDD Pattern 7

Alloca	ation	Re	lative power I	evel $\gamma_{\it PRB}$ [d	B]	PDSCH Data	
n_{P}	RB		Subframe	(Note 1)		Duta	
		0	5	4, 9	1 - 3, 6 - 8		
0 –	· 5	0	0	0	0	Note 2	
Note 1: Note 2:	The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes. These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is						
Note 3:	PDSCH. If two or PDSCH transmit mode 2.	more transmit a part of OCNG s antennas with The parameter	antennas with shall be transm ${\sf CRS}$ and acco	CRS are used nitted to the vir ording to the ar to each anten	in the test, the tual users by a ntenna transmi na port separa	e all the ssion ately, so	
N/A:	the transmit power of the PDSCH part of OCNG is equal between a transmit antennas with CRS used in the test. The antenna transmis modes are specified in clause 7.1 in TS 36.213. N/A: Not Applicable						

A.3.2.1.8 OCNG FDD pattern 8: outer resource blocks allocation in 10 MHz for MBSFN ABS

Table A.3.2.1.8-1: OP.8 FDD: OCNG FDD Pattern 8

Relative power level $\gamma_{\it PRB}$ [dB]

Subframe (Note 1)

0 –	12	0	0	0	N/A				
37 – 49		0	0	0	N/A	Note 2			
0 – 49		N/A	N/A	N/A	0				
Note 1: Note 2:	PDSCH allocation does not apply to subframes configured as PRS subframes. These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is								
Note 3:	QPSK m PDSCH. If two or part of C	QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH. If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2.							
The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmissio modes are specified in clause 7.1 in TS 36.213. Note 4: The subframe(s) configured as MBSFN ABS in a test shall not contain PMCH data and shall contain CRS only in the first symbol of the first ti slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.									

OCNG FDD pattern 9: full bandwidth allocation in 10 MHz for MBSFN ABS A.3.2.1.9

Table A.3.2.1.9-1: OP.9 FDD: OCNG FDD Pattern 9

Alloc	ation	R	[dB]	PDSCH Data		
n_P	RB		Subfra	me (Note 1)		Data
		0	5	4, 9	(1-3, 6-8) ^{Note4}	
0 –	49	0	0	0	0	Note 2
Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.						S
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is						ver the
	QPSK m	nodulated. The	e parameter	$\gamma_{\it PRB}$ is used t	o scale the power	r of
Note 3:	QPSK modulated. The parameter γ_{PRB} is used to scale the power PDSCH. Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by al transmit antennas with CRS and according to the antenna transmis					
	mode 2.	The paramete	er $\gamma_{_{PRR}}$ appl	lies to each an	tenna port separa	ately, so
Note 4:	 mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213. 4: The subframe(s) configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test. 					
N/A:	Not App	licable				

OCNG FDD pattern 10: outer resource blocks allocation in 10 MHz with user A.3.2.1.10 data in every subframe (without MBSFN)

Table A.3.2.1.10-1: OP.10 FDD: OCNG FDD Pattern 10

Allocation	on	Rel	ative power le	evel $\gamma_{{\scriptscriptstyle PRB}}$ [dE	3]	PDSCH Data		
n_{PRB}			Subframe	(Note 1)				
		0	5	4, 9	1 - 3, 6 - 8			
0 - 12		0	0	0	0	Note 2		
37 - 49)	0	0	0	0	NOIG Z		
Note 1:	The	allocation of a	ny PDSCH wit	h or without S	IB1 applies on	ly to the subframes		
		configured as F						
Note 2:						number of virtual		
		s with one PDS						
	PD	SCHs shall be เ	uncorrelated p	seudo random	ı data, which is	QPSK modulated.		
Note 3:	If tv		smit antennas	with CRS are	used in the tes	st, the PDSCH part		
						. The parameter		
	PD: in tl	applies to each antenna port separately, so the transmit power of the SCH part of OCNG is equal between all the transmit antennas with CRS used the test. The antenna transmission modes are specified in section 7.1 in 3GPP 36.213.						
N/A:	Not	Applicable						

A.3.2.1.11 OCNG FDD pattern 11: outer resource blocks allocation in 20 MHz

Table A.3.2.1.11-1: OP.11 FDD: OCNG FDD Pattern 11

Re	Relative power level γ_{PRB} [dB]						
	Subframe						
0	5	4,9	1-3, 6-8				
0	0	0	N/A	Note 1	N/A		
0	0	0	N/A	Note i	IN/A		
N/A	N/A	N/A	Note 4	N/A	Note 2		
	0 0	Subfit 0 5 0 0 0 0	Subframe 0 5 4,9 0 0 0 0 0 0	Subframe 0 5 4,9 1-3, 6-8 0 0 0 N/A 0 0 0 N/A	Subframe 0 5 4,9 1-3, 6-8 0 0 N/A Note 1 0 0 0 N/A		

- Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.
- Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
- Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS N/A: Not Applicable

Note 4:

Not Applicable

N/A:

A.3.2.1.12 OCNG FDD pattern 12: full bandwidth allocation in 20 MHz

Table A.3.2.1.12-1: OP.12 FDD: OCNG FDD Pattern 12

	ation	Re	Relative power level $\gamma_{\it PRB}$ [dB]					
$n_{\scriptscriptstyle F}$	PRB		Subframe					
		0	5	4, 9	1 - 3, 6 - 8			
0 -	99	0	0	0	N/A	Note 1	N/A	
0 -	99	N/A	N/A	N/A	Note 4	N/A	Note 2	
Note 1:	with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter							
Note 2:	Each ph each PR measure	used to scale the scale the scale resource RB shall be uncomment. The MB cell-specific Ref	block (PRB) is orrelated with o SFN data shal	s assigned to I data in other P I be QPSK mo	RBs over the publication RBs over the publicat	period of a	ny es shall	
The parameter γ_{PRB} is used to scale the power of PMCH. Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to							ith CRS	
	each an equal be	tenna port sepa etween all the tr ssion modes are	rately, so the ansmit antenn	transmit powe as with CRS ບ	r of the PDSCI sed in the test	H part of O	CNG is	

0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

PDSCH

N/A:

Allocation

Not Applicable

OCNG FDD pattern 13: outer resource blocks allocation in 20 MHz (without A.3.2.1.13 MBSFN)

Table A.3.2.1.13-1: OP.13 FDD: OCNG FDD Pattern 13

Alloc	ation	Re	B]	Data			
n_{P}	PRB		Subframe	(Note 1)		Data	
		0	5	4,9	1-3, 6-8		
0 –	37	0	0	0	N/A		
62 -	- 99	0	0	0	N/A	Note 2	
0 –	99	N/A	N/A	N/A	0		
Note 1: Note 2:	subfram These p virtual U OCNG F QPSK n PDSCH	="	ed as PRS subset of the period of the perio	oframes. ssigned to an all UE; the data dipseudo rando	arbitrary numb a transmitted com data, which cale the powe	er of over the n is r of	
Note 3:	If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by a transmit antennas with CRS and according to the antenna transmis mode 2. The parameter γ_{PRB} applies to each antenna port separathe transmit power of the PDSCH part of OCNG is equal between a transmit antennas with CRS used in the test. The antenna transmis						
	110000	modes are specified in section 7.1 in 3GPP TS 36.213.					

OCNG FDD pattern 14: full bandwidth allocation in 20 MHz (without MBSFN) A.3.2.1.14

Table A.3.2.1.14-1: OP.14 FDD: OCNG FDD Pattern 14

Alloc	ation	Re	B]	PDSCH Data				
n_P	RB		Subframe (Note 1)					
		0	5	4, 9	1 - 3, 6 - 8			
0 –	99	0	0	0	0	Note 2		
Note 1:	The allocation of any PDSCH with or without SIB1 applies only to the							
Note 2:	These p virtual U	subframes not configured as PRS subframes. These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is						
	QPSK m	nodulated. The	parameter $\gamma_{\scriptscriptstyle I}$	c_{RB} is used to s	scale the powe	r of		
Note 3:	QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH. If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission							
	mode 2.	The parameter	$\gamma_{\it PRB}$ applies	to each anten	na port separa	ately, so		
N/A:	mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213. Not Applicable							

A.3.2.1.15 OCNG FDD pattern 15: outer resource blocks allocation in 5 MHz

Table A.3.2.1.15-1: OP.15 FDD: OCNG FDD Pattern 15

Allocation	Re	lative power I	В]	PDSCH Data	PMCH Data	
$n_{\it PRB}$		Subfr				
	0	5	4,9	1-3, 6-8		
0 – 6	0	0	0	N/A	Note 1	N/A
18 – 24	0	0	0	N/A	Note	IN/A
0-24	N/A	N/A	N/A	Note 4	N/A	Note 2

- Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.
- Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
- Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

A.3.2.1.16 OCNG FDD pattern 16: full bandwidth allocation in 5 MHz

Table A.3.2.1.16-1: OP.16 FDD: OCNG FDD Pattern 16

Allocation	Re	lative power I	PDSCH Data	PMCH Data			
$n_{\it PRB}$		Subframe					
	0	5	4, 9	1 - 3, 6 - 8			

0 -	24	0	0	0	N/A	Note 1	N/A	
0 –	24	N/A	N/A	N/A	Note 4	N/A	Note 2	
Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.								
Note 2:								
	The para	ameter $\gamma_{{\scriptscriptstyle PRB}}$ is (used to scale t	he power of P	MCH.			
Note 3:		more transmit a shall be transmi						
	and acc	ording to the an	tenna transmi	ssion mode 2.	The paramete	er $\gamma_{_{PRB}}$ app	olies to	
Note 4:	equal be transmis	tenna port sepa etween all the tr ssion modes are 1 transmit anter	ansmit antenn e specified in s	as with CRS u ection 7.1 in 3	sed in the test GPP TS 36.21	. The anter	nna	

A.3.2.1.17 OCNG FDD pattern 17: outer resource blocks allocation in 20 MHz with user data in every subframe (without MBSFN)

Table A.3.2.1.17-1: OP.17 FDD: OCNG FDD Pattern 17

Allocation		Rel	Relative power level $\gamma_{\it PRB}$ [dB]					
$n_{{\scriptscriptstyle PRB}}$			Subframe	(Note 1)				
		0	5	4, 9	1 - 3, 6 - 8			
0 - 37		0	0	0	0	Note 2		
62 - 99		0	0	0	0	Note 2		
Note 1:	The	allocation of a	ny PDSCH wit	h or without S	IB1 applies on	ly to the subframes		
		configured as F						
Note 2:	Note 2: These physical resource blocks are assigned to an arbitrary number of virtual							
	UEs with one PDSCH per virtual UE; the data transmitted over the OCNG							
	PD	SCHs shall be u	uncorrelated p	seudo random	data, which is	s QPSK modulated.		

The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter

 γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable.

N/A: Not Applicable

PDSCH

N/A:

Allocation

Not Applicable

A.3.2.1.18 OCNG FDD pattern 18: outer resource blocks allocation in 5 MHz (without MBSFN)

Table A.3.2.1.18-1: OP.18 FDD: OCNG FDD Pattern 18

Alloc	ation	Re	Relative power level $\gamma_{\it PRB}$ [dB]					
n_P	PRB		Subframe	(Note 1)		Data		
		0	5	4,9	1-3, 6-8			
0 -	- 6	0	0 0 N/A		N/A			
18 -	- 24	0	0	0	N/A	Note 2		
0 -	24	N/A	N/A	N/A	0			
Note 1: Note 2:	The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes. These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter \$\gamma_{PRB}\$ is used to scale the power of PDSCH.							
Note 3:	PDSCH transmit mode 2. the trans transmit	more transmit a part of OCNG a antennas with . The parameter smit power of the antennas with	shall be transing CRS and according γ_{PRB} applies the PDSCH partices are the CRS used in the CRS used in the CRS are transfer and the cRS are transfer are the cRS are transfer are tr	nitted to the viruling to the art to each anten to f OCNG is enterting to the test. The art of the test.	tual users by a ntenna transmi na port separa qual between ntenna transmi	all the ission ately, so all the		
	modes a	are specified in	section 7.1 in 3	3GPP 15 36.2	13.			

OCNG FDD pattern 19: full bandwidth allocation in 5 MHz (without MBSFN) A.3.2.1.19

Table A.3.2.1.19-1: OP.19 FDD: OCNG FDD Pattern 19

Allocation Relative power level γ_{PRB} [dB] Subframe (Note 1)						PDSCH Data	
n_P	'RB			Data			
		0	5	4, 9	1 - 3, 6 - 8		
0 –	24	0	0	0	0	Note 2	
Note 1:		cation of any Pl			pplies only to	the	
		es not configure				_	
Note 2:	•	hysical resource		•	•		
		Es with one PD					
	OCNG F	PDSCHs shall b	e uncorrelated	l pseudo rando	om data, which	n is	
	QPSK m	nodulated. The	parameter $\gamma_{\scriptscriptstyle I}$	$_{RB}$ is used to s	scale the powe	er of	
	PDSCH.						
Note 3:	If two or	more transmit	antennas with	CRS are used	I in the test, the	е	
	PDSCH	part of OCNG	shall be transm	nitted to the vir	tual users by a	all the	
	transmit	antennas with	CRS and acco	rding to the ar	ntenna transmi	ssion	
	mode 2.	The parameter	$\gamma_{_{PRB}}$ applies	to each anten	na port separa	ately, so	
	the trans	smit power of th	e PDSCH par	of OCNG is e	equal between	all the	
	transmit antennas with CRS used in the test. The antenna transmission						
	modes are specified in section 7.1 in 3GPP TS 36.213.						
N/A:	Not App	licable					

A.3.2.1.20 OCNG FDD pattern 20: outer resource blocks allocation in 5 MHz with user data in every subframe (without MBSFN)

Table A.3.2.1.20-1: OP.20 FDD: OCNG FDD Pattern 20

Allocation		Rela	ative power l	3]	PDSCH Data			
n_{PRB}			Subframe	(Note 1)				
		0	5	4, 9	1 - 3, 6 - 8			
0 - 6		0	0	0	0	Note 2		
18 - 24		0	0	0	0			
Note 1:	Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.							
Note 2:	UE:	These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated.						
Note 3:	The parameter γ_{PRB} is used to scale the power of PDSCH. 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter							
	γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.							
N/A:	Not	Applicable.						

A.3.2.2 OCNG Patterns for TDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test). The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols without and with reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i RA/OCNG RA = PDSCH_i RB/OCNG RB,$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. The number of PDCCH OFDM symbols in the non-MBSFN subframes is the same as specified in the RMC used in the test. The number of PDCCH OFDM symbols in the MBSFN subframe is the maximal allowed according to TS 36.213 [16]. For any aggregation and PHICH allocation, the PDCCH and any unused PHICH groups are padded with resource element groups with a power level given by PDCCH_RA/RB and PHICH_RA/RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

For subframes configured as PRS subframes the PDSCH allocation defined in the OCNG pattern does not apply.

For subframes configured as ABS subframes the PDSCH and PMCH allocation defined in the OCNG pattern does not apply.

The system information is scheduled in the allocations reserved for the OCNG patterns, in the subframes not configured for MBSFN. For this purpose the number of the RB-s allocated with PDSCH defined in the OCNG pattern can be reduced as necessary.

A.3.2.2.1 OCNG TDD pattern 1: outer resource blocks allocation in 10 MHz

Table A.3.2.2.1-1: OP.1 TDD: OCNG TDD Pattern 1 for 5ms downlink-to-uplink switch-point periodicity

Allocation		Relative power level $\gamma_{\it PRB}$ [dB]							
n_{PRB}		Subframe (Note 1)							
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe)					
0 – 12	0	0	0	Table	Nata 0				
37 – 49	0	0	0	A.3.2.2.1-2	Note 2				

- Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in TS 36.211 [16].
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Table A.3.2.2.1-2: OP.1 TDD: OCNG TDD Pattern 1 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation	Relative power level γ_{PRB} [dB]								
$n_{\it PRB}$	Special subframe configuration								
	0	1	2	3	4	5	6	7	8
		Control region OFDM symbols							
	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2
0 – 12	0	0	_	_	_	0	0	0	0
0 – 12	U	U	U	U	U	U	U	><	\times
37 – 49	0	0	_	_	_	0	_	0	0
31 – 49	U	U	U	U	U	U	U	> <	$>\!\!<$
Note 1: Special su	Note 1: Special subframe configurations are defined in Table 4.2-1 in TS 36.211 [16].								

A.3.2.2.2 OCNG TDD pattern 2: full bandwidth allocation in 10 MHz

Table A.3.2.2.2-1: OP.2 TDD: OCNG TDD Pattern 2 for 5ms downlink-to-uplink switch-point periodicity

Allocation		Relative power level $\gamma_{\it PRB}$ [dB]						
$n_{{\scriptscriptstyle PRB}}$								
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) ^{Note 3}	1 and 6 (as special subframe)				

TS 36.213.

() – 49	0	0	0	0	Note 2		
Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.								
Note 2:	Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK							
	modulated. T	he parameter $\gamma_{\scriptscriptstyle PRI}$	$_{ m 3}$ is used to scale the p	ower of PDSCH.				
Note 3:	Subframes av 36.211 [16].	vailable for DL trar	nsmission depends on	the Uplink-Downlink co	onfiguration in Ta	ble 4.2-2 in TS		
Note 4:								
	parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in							

A.3.2.2.3 OCNG TDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table A.3.2.2.3-1: OP.3 TDD: OCNG TDD Pattern 3 for 5 ms downlink-to-uplink switch-point periodicity

Allocation		Relative power level γ_{PRB} [dB]								
$n_{\it PRB}$		Subframe (Note 1)							
	0	5	3, 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe)						
0 – 1	0	0	0	0						
4 – 5	0	0	0	0	Note 2					

- Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in TS 36.211 [16].
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

A.3.2.2.4 OCNG TDD pattern 4: full bandwidth allocation in 1.4 MHz

Table A.3.2.2.4-1: OP.4 TDD: OCNG TDD Pattern 4 for 5 ms downlink-to-uplink switch-point periodicity

Allocation		Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]							
$n_{\it PRB}$		Subframe	(Note 1)						
	0	5	3 , 4, 8, 9 and 6 (as normal subframe)	1 and 6 (as special subframe)					

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	0 – 5	0	0	0	0	Note 2			
Note 1:	The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.								
Note 2:				bitrary number of virtual all be uncorrelated pse					
	modulated.Th	ne parameter $\gamma_{{\scriptscriptstyle PRB}}$	is used to scale the po	ower of PDSCH.					
Note 3:	Subframes at 36.211 [16].	vailable for DL trar	nsmission depends on	the Uplink-Downlink co	onfiguration in Ta	ble 4.2-2 in TS			
Note 4:				n the test, the OCNG s rding to the antenna tra					
		KD · ·		ely, so the transmit por enna transmission mod					

A.3.2.2.5 OCNG TDD pattern 5: outer resource blocks allocation in 10 MHz for MBSFN ABS

Table A.3.2.2.5-1: OP.5 TDD: OCNG TDD Pattern 5 for 5ms downlink-to-uplink switch-point periodicity

Allocation		Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]							
n_{PRB}		Subframe (Note 1)							
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe)					
0 – 12	0	0	0	Table	Nata 0				
37 – 49	0	0	0	A.3.2.2.1-2	Note 2				

- Note 1: PDSCH allocation does not apply to subframes configured as PRS subframes.
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in TS 36.211 [16]. Any of the subframes 3, 4, 8 and 9 configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Table A.3.2.2.5-2: OP.5 TDD: OCNG TDD Pattern 5 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation		Relative power level $\gamma_{{\scriptscriptstyle PRB}}$ [dB]										
$n_{\it PRB}$		Special subframe configuration										
	0	1 2 3 4 5 6 7 8										
		Control region OFDM symbols										
	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2			
0 – 12	0	0	0	0	0	0	0	0	0			
0 - 12	U	U	U	U	U	U	U	><	><			
37 – 49	0	0 0 0 0 0 0 0										
37 - 49	U	U	U	U	U	U	U	><	><			
Note 1: Special	l subframe d	configuration	ons are defir	ned in Tab	le 4.2-1 in	TS 36.211	[16].					

A.3.2.2.6 OCNG TDD pattern 6: full bandwidth allocation in 10 MHz for MBSFN ABS

Table A.3.2.2.6-1: OP.6 TDD: OCNG TDD Pattern 6 for 5ms downlink-to-uplink switch-point periodicity

Allocation		Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]								
n_{PRB}		Subframe	(Note 1)							
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) ^{Note 3}	1 and 6 (as special subframe) Note 3						
0 – 49	0	0	0	0	Note 2					

- Note 1: PDSCH allocation does not apply to subframes configured as PRS subframes.
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRR} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in TS 36.211 [16]. Any of the subframes 3, 4, 8 and 9 configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

A.3.2.2.7 OCNG TDD pattern 7: outer resource blocks allocation in 20 MHz

Table A.3.2.2.7-1: OP.7 TDD: OCNG TDD Pattern 7 for 5ms downlink-to-uplink switch-point periodicity

Allocation		Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]							
$n_{\it PRB}$		Subframe (Note 1)							
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe)					
0 – 37	0	0	0	Table	N . O				
62 – 99	0	0	0	A.3.2.1.7-2	Note 2				

- Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [16].
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Table A.3.2.2.7-2: OP.7 TDD: OCNG TDD Pattern 7 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation	£		Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]																
n_{PRB}	length		Special subframe configuration																
	<u>•</u>	(0	1 2 3 4 5 6 7 8								3							
	<u>გ</u>			Control region OFDM symbols															
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 37	N		n		n		n		1		Λ		0	(1	()	()
0 – 37		,	<u> </u>	,	<u> </u>	,	0	,	J		0		0	,	,	>	<	\geq	<
62 – 99	N		n																
02 – 99		,	0	'	0		U	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<u> </u>		U		0	,	,	>	\leq	\geq	<
Note 1: Special	subfram	e con	nfigura	ations	are c	lefine	d in Ta	able 4	1.2-1	in TS	36.2	11 [16	6].						

A.3.2.2.8 OCNG TDD pattern 8: full bandwidth allocation in 20 MHz

Table A.3.2.2.8-1: OP.8 TDD: OCNG TDD Pattern 8 for 5ms downlink-to-uplink switch-point periodicity

Allocation		Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]								
$n_{\it PRB}$		Subframe	(Note 1)							
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) ^{Note 3}	1 and 6 (as special subframe) Note 3						
0 – 99	0	0	0	0	Note 2					

- Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [16].
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

A.3.2.2.9 OCNG TDD pattern 9: outer resource blocks allocation in 5 MHz

Table A.3.2.2.9-1: OP.9 TDD: OCNG TDD Pattern 9 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}		Relative power level γ_{PRB} [dB] Subframe (Note 1)								
PRB		Subir								
	0	5	3 , 4, 8, 9 and 6 (as normal	1 and 6 (as special						
			subframe) Note 3	subframe) Note 3						
0 – 6	0	0	0	Table A.3.2.1.7-	Nata O					
18 – 24	0	0	0	2	Note 2					

- Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [16].
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Table A.3.2.2.9-2: OP.9 TDD: OCNG TDD Pattern 9 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation	Ę		Relative power level γ_{PRB} [dB]									
$n_{\it PRB}$	length		Special subframe configuration									
	<u>•</u>	0	1 2 3 4 5 6 7 8									
	<u>9</u>		Control region OFDM symbols									
		1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2		
0 – 6	N	0	0	0	0	0	0	0	0	0		
0 - 0		O	U	U	U	U	U	U	><	$>\!\!<$		
18 – 24	N	0										
10 - 24		O	U	U	U	U	U	U	$>\!\!<$	$>\!\!<$		
Note 1: Special	subfram	e configura	ations are c	defined in Ta	able 4.2-1	in TS 36.2	11 [16].		•			

A.3.2.2.10 OCNG TDD pattern 10: full bandwidth allocation in 5 MHz

Table A.3.2.2.10-1: OP.10 TDD: OCNG TDD Pattern 10 for 5ms downlink-to-uplink switch-point periodicity

Allocatio	n	Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]								
$n_{\it PRB}$		Subframe (Note 1)								
	0	5	3, 4, 8, 9 and 6 (as normal subframe) ^{Note 3}	1 and 6 (as special subframe)						
0 – 24	0	0	0	0	Note 2					
	configured as PRS These physical res	The allocation of any PDSCH with or without SIB1 applies only to the subframes on on the subframes. These physical resource blocks are assigned to an arbitrary number of virtual UE PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be un								
	pseudo random da power of PDSCH.	ta, which is QPS	K modulated. The para	meter $\gamma_{\it PRB}$ is used to	scale the					

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [16].

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

A.3.3 Reference DRX Configurations

Table A.3.3-1: Reference DRX Configurations

Parameter	Va	lue	Comments	
Reference configuration	DRX_S	DRX_L	As defined in 4.8.2.1.5 in TS 36.508	
onDurationTimer	psf2	psf6		
drx-InactivityTimer	psf100	psf1920		
drx-RetransmissionTimer	psf16	psf16		
longDRX-CycleStartOffset	sf40, 0	sf1280, 0		
shortDRX	disabled	disabled		
Note: For further information see clause 6.3.2 in TS 36.331.				

A.3.4 ABS Transmission Configurations

A.3.4.1 Non-MBSFN ABS Transmission Configurations

A.3.4.1.1 Non-MBSFN ABS Transmission, 1x2 antenna with PBCH

Table A.3.4.1.1-1: Transmission configuration with non-MBSFN ABS, 1x2 with PBCH

Physical	Parameters	EPRE, [dB]	
Channels and Signals		Non-ABS	ABS
PBCH	PBCH_RA	0	0
FBCIT	PBCH_RB	0	0
PSS	PSS_RA	0	0
SSS	SSS_RA	0	0
PCFICH	PCFICH_RB	0	0 Note 1
PHICH	PHICH_RA	0	-Inf
	PHICH_RB	0	-Inf
PDCCH	PDCCH_RA	0	0 Note 1
РЬССП	PDCCH_RB	0	0 Note 1
PDSCH	PDSCH_RA	0	0 Note 1
	PDSCH_RB	0	0 Note 1
OCNG	OCNG_RA	0	-Inf
	OCNG_RB	0	-Inf
NOTE 1: Only used for SIB1, otherwise EPRE is –Inf			

NOTE 1: Only used for SIB1, otherwise EPRE is –Inf NOTE 2: 1x2 antenna configuration is assumed

A.3.4.1.2 Non-MBSFN ABS Transmission, 2x2 antenna without PBCH

Table A.3.4.1.2-1: Transmission configuration #1 with non-MBSFN ABS, 2x2 without PBCH

Physical		EPRE, [dB]	
Channels and Signals	Parameters	Non-ABS	ABS
PBCH	PBCH_RA	-3	-Inf
FBCIT	PBCH_RB	-3	-Inf
PSS	PSS_RA	-3	-3
SSS	SSS_RA	-3	-3
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
FILCH	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	1	-Inf
PDCCH	PDCCH_RB	1	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

Table A.3.4.1.2-2: Transmission configuration #2 with non-MBSFN ABS, 2x2 without PBCH

Physical		EPRE, [dB]	
Channels and Signals	Parameters	Non-ABS	ABS
PBCH	PBCH_RA	-3	-Inf
FBCII	PBCH_RB	-3	-Inf
PSS	PSS_RA	-3	-3
SSS	SSS_RA	-3	-3
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
FILCH	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	-3	-Inf
РИССП	PDCCH_RB	-3	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

A.3.4.2 MBSFN ABS Transmission Configurations

A.3.4.2.1 MBSFN ABS Transmission, 1x2 antenna

Table A.3.4.2.1-1: Transmission configuration with MBSFN ABS, 1x2

Physical	•		E, [dB]
Channels and Signals	Parameters	Non-ABS	ABS
DDCII	PBCH_RA	0	N/A
PBCH	PBCH_RB	0	N/A
PSS	PSS_RA	0	N/A
SSS	SSS_RA	0	N/A
PCFICH	PCFICH_RB	0	-Inf
DUICH	PHICH_RA	0	-Inf
PHICH	PHICH_RB	0	-Inf
PDCCH	PDCCH_RA	0	-Inf
	PDCCH_RB	0	-Inf
PDSCH	PDSCH_RA	0	-Inf
	PDSCH_RB	0	-Inf
PMCH	PMCH_RA	0	-Inf
	PMCH_RB	0	-Inf
OCNG	OCNG_RA	0	-Inf
	OCNG_RB	0	-Inf
NOTE: 1x2 antenna configuration is assumed			

A.3.4.2.2 MBSFN ABS Transmission, 2x2 antenna

Table A.3.4.2.2-1: Transmission configuration #1 with MBSFN ABS, 2x2

Physical		EPRE, [dB]	
Channels and Signals	Parameters	Non-ABS	ABS
PBCH	PBCH_RA	-3	N/A
РВСП	PBCH_RB	-3	N/A
PSS	PSS_RA	-3	N/A
SSS	SSS_RA	-3	N/A
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
PRICE	PHICH_RB	-3	-Inf
DDCCH	PDCCH_RA	1	-Inf
PDCCH	PDCCH_RB	1	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
PMCH	PMCH_RA	-3	-Inf
	PMCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

Table A.3.4.2.2-2: Transmission configuration # 2 with MBSFN ABS, 2x2

Physical		EPRE, [dB]	
Channels and Signals	Parameters	Non-ABS	ABS
PBCH	PBCH_RA	-3	N/A
РВСП	PBCH_RB	-3	N/A
PSS	PSS_RA	-3	N/A
SSS	SSS_RA	-3	N/A
PCFICH	PCFICH_RB	1	-Inf
DUICH	PHICH_RA	-3	-Inf
PHICH	PHICH_RB	-3	-Inf
DDCCH	PDCCH_RA	-3	-Inf
PDCCH	PDCCH_RB	-3	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
PMCH	PMCH_RA	-3	-Inf
	PMCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

A.3.5 Impact of Reference Sensitivity Degradation with Carrier Aggregation on Test Cases

A.3.5.1 Impact of Reference Sensitivity Degradation due to Insertion Loss

For a UE supporting inter-band carrier aggregation configuration with uplink in one E-UTRA band, if there is a relaxation of receiver sensitivity $\Delta R_{IB,c} > 0$ dB as defined in TS 36.101 [5], 7.3.1-1A, there is no adjustment of test parameters in the tests specified in TS 36.133 when $\Delta R_{IB,c} \le 1$ dB.

A.3.6 Carrier Aggregation Test Cases with Different Channel Bandwidth Combinations

A.3.6.1 Introduction

In Annex A carrier aggregation test cases may be defined with different channel bandwidth combinations to verify the same RRM requirement.

If multiple carrier aggregation test cases with different channel bandwidth combinations are defined to verify the same RRM requirement that is channel bandwidth independent, then the UE needs to be tested only with one bandwidth combination out of the bandwidth combination sets supported by that UE.

A.3.7 Test Cases with Different Channel Bandwidths

A.3.7.1 Introduction

This clause defines a principle which is applicable to test cases verifying RRM requirements for single carrier operation.

A.3.7.2 Principle of testing

Test cases defined for 5MHz channel bandwidth that reference this clause are applicable to UEs that support only Band 31.

A.3.8 Antenna Configuration

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

A.3.9 Carrier Aggregation Test Cases with Different Duplex Modes

A.3.9.1 Introduction

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

A.3.9.2 Principle of testing

In Annex A carrier aggregation test cases may be defined for different duplex modes or combination of duplex modes (E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD) to verify the same RRM requirement.

If multiple carrier aggregation test cases are defined for different duplex modes (E-UTRA FDD or E-UTRA TDD) or for combination of duplex modes (E-UTRA TDD-FDD) to verify the same RRM requirement which is independent of the duplex mode and is identical for different duplex modes or combination of duplex modes, then from UE the performance point of view the test coverage can be considered fulfilled by executing only the corresponding test case(s) with one of the duplex modes supported by the UE.

A.3.10 Carrier Aggregation Test Cases with Different CA Configurations

A.3.10.1 Introduction

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

A.3.10.2 Principle of testing

In Annex A carrier aggregation test cases may be defined for two CCs as well as for more than two CCs to verify the same RRM requirement.

If multiple carrier aggregation test cases are defined for two CCs as well as for more than two CCs to verify the same RRM requirement, then from the UE performance point of view the test coverage can be considered fulfilled by executing only the test cases with the maximum number of CCs supported by the UE.

Editor's note: whether it is sufficient to test for any one of the band combinations supported by the UE is FFS.

A.3.11 Test Cases for Synchronous and Asynchronous Dual Connectivity

A.3.11.1 Introduction

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

A.3.11.2 Principle of Testing

In Annex A test cases may be defined in both synchronous DC and asynchronous DC scenarios to verify the same RRM requirement.

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

A.3.12 Proximity-based Services

A.3.12.1 Introduction

This clause also defines the principle and the reference configurations that are applicable to test cases verifying RRM core requirements for ProSe Direct Discovery and ProSe Direct Communication.

A.3.12.2 Reference DRX configurations for ProSe tests

Table A.3.12.2-1: Reference DRX Configurations

Parameter	Value	
Reference configuration	DRX_P1	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf320, 0	
shortDRX Disabled		
Note: For further information see clause 6.3.2 in TS 36.331.		

A.3.12.3 Test Cases with Different Channel Bandwidths

A.3.12.3.1 Introduction

This clause defines a principle which is applicable to test cases verifying ProSe RRM requirements with different channel bandwidths.

A.3.12.3.2 Principle of testing

Some ProSe test cases are defined for different channel bandwidths to verify the same RRM requirement.

If test cases with different channel bandwidth are defined to verify the same RRM requirement then the UE is required to pass the test cases only with one of the channel bandwidths.

A.3.12.4 Reference resource pool configurations for ProSe Direct Discovery

Table A.3.12.4-1: ProSe Direct Discovery configuration for E-UTRA FDD (Configuration #1)

	Informati	on Element		Value
discRxPool	cp-Len			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	prb-Num		12
		prb-Start		0
		prb-End		23
		offsetIndicator		160
		subframeBitmap		11000000
		,		00000000
				00000000
				00000000
				00000000
	txParameters			not present
	rxParameters			not present
discTxPoolCommon	cp-Len			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	prb-Num		2
		prb-Start		3
		prb-End		5
		offsetIndicator		160
		subframeBitmap		10000000
				00000000
				00000000
				00000000
				00000000
	txParameters	txParametersGeneral	alpha	al0
			p0	31
		ue- SelectedResourceConfig	poolSelection	random
			txProbability	p100
	rxParameters			not present
discTxPowerInfo	discMaxTxPower			23
SL-SyncConfig	syncCP-Len			Normal
	syncOffsetIndicator			35 (155
				mod 40)
	slssid			30
	txParameters	txParametersGeneral	alpha	al0
			p0	31
		syncTxThreshIC		0 (-infinity)
	rxParamsNCell			not present
discInterFreqList				not present

Table A.3.12.4-2: ProSe Direct Discovery configuration for E-UTRA FDD (Configuration #2)

	Informati	on Element	Value
discRxPool	cp-Len		Normal
	discPeriod		rf32
	numRetx		0
	numRepetition		1
	tf-ResourceConfig	prb-Num	12
		prb-Start	0
		prb-End	23
		offsetIndicator	160
		subframeBitmap	11000000
			0000000
			00000000
			00000000
			0000000
	txParameters		not present
	rxParameters	tdd-Config	not present
		syncConfigIndex	0
discTxPoolCommon			not present
discTxPowerInfo	discMaxTxPower		23
SL-SyncConfig	syncCP-Len		Normal
	syncOffsetIndicator		20 (140
			mod 40)
	slssid		30
	txParameters		not present
	rxParamsNCell	physCellId	1
		discSyncWindow	w1
discInterFreqLis			not present

Table A.3.12.4-3: ProSe Direct Discovery configuration for E-UTRA TDD Config 0 (Configuration #3)

	Informat	on Element		Value
discRxPool	cp-Len			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	prb-Num		12
		prb-Start		0
		prb-End		23
		offsetIndicator		163
		subframeBitmap		11000000
		,		00000000
				00000000
				00000000
				00000000
				00
	txParameters			not present
	rxParameters			not present
discTxPoolCommon	cp-Len			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	prb-Num		2
		prb-Start		3
		prb-End		5
		offsetIndicator		163
		subframeBitmap		10000000
				00000000
				00000000
				00000000
				00000000
		_		00
	txParameters	txParametersGeneral	alpha	al0
			p0	31
		ue- SelectedResourceConfig	poolSelection	random
			txProbability	p100
	rxParameters			not present
discTxPowerInfo	discMaxTxPower			23
SL-SyncConfig	syncCP-Len			Normal
	syncOffsetIndicator			38 (158 mod 40)
	slssid			30
	txParameters	txParametersGeneral	alpha	al0
			p0	31
		syncTxThreshIC	1	0 (-infinity)
	rxParamsNCell			not present
discInterFreqList				not present

A.3.12.5 Reference resource pool configurations for ProSe Direct Communication

Table A.3.12.5-1: ProSe Direct Communication configuration for E-UTRA FDD (Configuration #1)

	Information Eleme	ent		Value (5MHz)	Value (10MHz)
commRxPool	sc-CP-Len			Normal	, ,
	sc-Period			sf40	
	sc-TF-ResourceConfig	prb-Num		12	25
		prb-Start		0	0
		prb-End		23	49
		offsetIndicator		0	
				0001100	
				0000000	
		subframeBitmap		0000000	
				0000000	
				0000000	0
	data-CP-Len			Normal	
	dataHoppingConfig	hoppingParameter		0	
		numSubbands		ns1	
		rb-Offset		0	
	ue-	data-TF-	prb-Num	12	25
	SelectedResourceConfig	ResourceConfig	pro-ivarii	12	25
			prb-Start	0	0
			prb-End	23	49
			offsetIndicator	0	
				0000000	0
				1111111	1
			subframeBitmap	1111111	1
				1111111	1
				1111111	1
		trpt-Subset-r12		001	
	rxParametersNCell			not prese	ent
	txParameters			not prese	ent
commTxPoolNormalCommon	sc-CP-Len			Normal	
	sc-Period			sf40	
	sc-TF-ResourceConfig	prb-Num		12	25
		prb-Start		0	0
		prb-End		24	49
		offsetIndicator		0	
				0001100	0
				0000000	0
		subframeBitmap		0000000	0
				0000000	0
				0000000	0
	data-CP-Len			Normal	
	dataHoppingConfig	hoppingParameter		0	
		numSubbands		ns1	
		rb-Offset		0	
	ue-	data-TF-	nrh Num	12	25
	SelectedResourceConfig	ResourceConfig	prb-Num	14	25
			prb-Start	0	0
			prb-End	23	49
			offsetIndicator	0	
				0000000	
	subframeBitmap 1		1111111		
			1111111		
				1111111	
				1111111	1
		trpt-Subset-r12		001	
	rxParametersNCell			not prese	ent
	txParameters	sc-TxParameters	alpha	al0	
			p0	31	
		dataTxParameters	alpha	al0	

			p0	31
SL-SyncConfig	syncCP-Len			Normal
	syncOffsetIndicator			2
	slssid			30
	txParameters	txParametersGeneral	alpha	al0
			p0	31
		syncTxThreshIC		0 (-infinity)
	rxParamsNCell			not present

Table A.3.12.5-2: ProSe Direct Communication pre-configuration for E-UTRAN FDD for out-of-network coverage operation (Configuration #2)

	Information Element			Value (5MHz)	Value (10MHz)
preconfigSync	syncCP-Len-r12			Normal	, ,
, ,	syncOffsetIndicator1			2	
	syncOffsetIndicator2			1	
	syncTxParameters			31	
	syncTxThreshOoC			0 (-110dBi 15kHz)	m /
	filterCoefficient			fc0	
	syncRefMinHyst			dB0	
	syncRefDiffHyst			dB0	
preconfigComm	sc-CP-Len			Normal	
, ,	sc-Period			sf40	
	sc-TF-ResourceConfig	prb-Num		12	25
		prb-Start		0	0
		prb-End		23	49
		offsetIndicator		0	
		subframeBitmap		0001100 0000000 0000000 0000000	00 00 00
	data-CP-Len			Normal	
	dataHoppingConfig	hoppingParameter		0	
		numSubbands		ns1	
		rb-Offset		0	
	ue- SelectedResourceConfig	data-TF- ResourceConfig	prb-Num	12	25
			prb-Start	0	0
			prb-End	23	49
			offsetIndicator	0	
			subframeBitmap	0000000 1111111 1111111 1111111	1 1 1
		trpt-Subset-r12		001	

A.3.12.6 Reference Measurement Channels for ProSe Direct Discovery

A.3.12.6.1 FDD

Table A.3.12.6-1: PSDCH Reference Measurement Channels for FDD

Parameter	Unit	Value		
Reference channel		D.1 FDD		
Channel bandwidth	MHz	5		
Allocated resource blocks		2		
Subcarriers per resource block		12		
Allocated subframes per Discovery period		1		
DFT-OFDM Symbols per subframe (see		11		
note)				
Modulation		QPSK		
Information Bit Payload		232		
Transport block CRC	Bits	24		
Maximum number of HARQ transmissions		1		
Binary Channel Bits (see note)	Bits	528		
NOTE1: PSDCH transmissions are rate-matched for 12 DFT-OFDM				
symbols per subframe, and the last symbol shall be				
punctured as per TS 36.211.				

A.3.12.7 Reference measurement channels for ProSe Direct Communication

A.3.12.7.1 FDD

Table A.3.12.7-1: PSCCH Reference Measurement Channels for FDD

	Parameter	Unit	Val	ue
Reference ch	nannel		CC.1 FDD	CC.2 FDD
Channel ban	dwidth	MHz	5	10
Allocated res	ource blocks		1	1
Subcarriers p	per resource block		12	12
DFT-OFDM (see Note 1)	Symbols per subframe		11	11
Modulation			QPSK	QPSK
Information E	Bit Payload	Bits	41	43
	Frequency hopping flag		C	
	RB assignment		Set as per PSSCH RB allocation specific in the te	
Information	Time resource pattern (I _{TRP})		0 (No	te 2)
bits	Modulation and coding scheme		Set as the PSSCH MCS specified in the test	
	Timing advance indication		C)
	Group destination ID		As set by hi	gher layers
Transport blo		Bits	16	16
Maximum nu	mber of HARQ transmissions		2	2
Binary Chani	nel Bits (see Note 1)	Bits	264	264
NOTE1: PSCCH transmissions are rate-matched for 12 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211.				
NOTE 2: For N _{TRR} = 8 (FDD) and $trnt$ -Subset = 001 t_{TRR} = 0 corresponds to a time				

Table A.3.12.7-1: PSSCH Reference Measurement Channels for FDD

Parameter	Unit	Value		
Reference channel		CD.1 FDD	CD.2 FDD	
Channel bandwidth	MHz	5	10	
Allocated resource blocks		2	3	
Subcarriers per resource block		12	12	
DFT-OFDM Symbols per subframe (see Note 1)		11	11	
Modulation		QPSK	QPSK	
Target Code Rate		1/3	1/3	
Information Bit Payload		176	256	
Transport block CRC	Bits	24	24	
Maximum number of HARQ transmissions		3	3	
Binary Channel Bits (see note)	Bits	528 1056		
NOTE1: DSDCH transmissions are rate matched for 12 DET OEDM symbols per				

NOTE1: PSDCH transmissions are rate-matched for 12 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211.

A.3.12.8 ProSe Receive Traffic Generator

This clause defines the configuration for active Sidelink UEs used to generate receive traffic in ProSe RRM tests.

A.3.12.8.1 ProSe Direct Communication Receive Traffic Generator for FDD

Table A.3.12.8.1-1: Active Sidelink UE configuration for ProSe Direct Communication

Configuration			PCP.1.FDD
	Channel BW MHz		5 or 10
Number of Active	Sidelink UEs per sc-period		5 MHz: 12 10 MHz: 16
	PSCCH RMC (defined in A.3.12.7)		5 MHz: CC.1 FDD 10 MHz: CC.2 FDD
	PSCCH resource allocation		5MHz: [2i:2i], for Sidelink UE i=0,,11 10MHz:[3i:3i], for Sidelink UE i = 0,, 15
Active Sidelink UEs			5 MHz: CD.1 FDD 10 MHz: CD.2 FDD
	PSSCH resource allocation		Non-overlapping RBs 5MHz: [2i:2i+1], for Sidelink UE i = 0,, 11 10MHz:[3i:3i+2], for Sidelink UE i = 0,, 15
	RSRP	dBm/15kHz	-98

A.3.12.8.2 ProSe Direct Discovery Receive Traffic Generator for FDD

Table A.3.12.8.2-1: Active Sidelink UE configuration for ProSe Direct Discovery

Configuration			PDP.1.FDD PDP.2.FDD		
Channel BW		MHz		5	
Number of Active subframe	per of Active Sidelink UEs per Discovery ame		12		
Active Sidelink UEs	Sidelink UE Transmissions		PSDCH (RMC D.1 FDD)	PSDCH (RMC D.1 FDD) + SLSS on synchronization subframe	
	Resource allocation		Non overlapping RBs in a subframe		
	RSRP	dBm/15kHz	-95		

A.3.13 Time Offset between Cells

A.3.13.1 Introduction

In Annex A in some test cases a parameter called, 'time offset between cells' is used. The meaning of this parameter is defined in this clause.

A.3.13.2 Definition

Unless explicitly stated otherwise, the time offset between cells for a pair of cells is defined as the difference between radio frame start timings of the pair of cells.

A.4 E-UTRAN RRC_IDLE state

A.4.2 Cell Re-Selection

A.4.2.1 E-UTRAN FDD – FDD Intra frequency case

A.4.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency cell reselection requirements specified in clause 4.2.2.3.

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.4.2.1.1-1 and A.4.2.1.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

Table A.4.2.1.1-1: General test parameters for FDD intra frequency cell reselection test case

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

Table A.4.2.1.1-2: Cell specific test parameters for FDD intra frequency cell reselection test case in AWGN

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel Number			1			1	
BW _{channel}	MHz		10			10	
OCNG Patterns defined in A.3.2.1.2 (OP.2 FDD)		C	P.2 FDD			OP.2 FDD	1
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB	dB		0			0	
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA ^{Note 1}							
OCNG_RB ^{Note 1}							
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
Qhyst _s	dB	0	0	0	0	0	0
Qoffset _{s, n}	dB	0	0	0	0	0	0
Cell_selection_and_ reselection_quality_ measurement			RSRP			RSRP	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	16	-3.11	2.79	-infinity	2.79	-3.11
$N_{oc}^{ m Note2}$	dBm/15 kHz				-98		
\hat{E}_s/N_{oc}	dB	16	13	16	-infinity	16	13
RSRP Note3	dBm/15 kHz	-82	-85	-82	-infinity	-82	-85
Treselection	S	0	0	0	0	0	0
Sintrasearch	dB		Not sent			Not sent	
Propagation Condition					AWGN		

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over

subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

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

A.4.2.1.2 Test Requirements

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

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

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

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

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

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

Where:

T_{evaluateFDD.intra}

T_{detect,EUTRAN_Intra} See Table 4.2.2.3-1 in clause 4.2.2.3

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to

camp on a cell; 1280 ms is assumed in this test case.

See Table 4.2.2.3-1 in clause 4.2.2.3

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

A.4.2.2 E-UTRAN TDD – TDD Intra frequency case

A.4.2.2.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD intra frequency cell reselection requirements specified in clause 4.2.2.3.

The test scenario comprises of 1 E-UTRA TDD carrier and 2 cells as given in tables A.4.2.2.1-1 and A.4.2.2.1-2. The test consists of three successive time periods, with time duration of T1, T2, and T3 respectively. Only cell 1 is already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.2.1-1: General test parameters for TDD intra frequency cell re-selection test case

	Parameter	Unit	Value	Comment
Initial	Active cell		Cell1	
condition	Neighbour cells		Cell2	
T2 end	Active cell		Cell2	
condition	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA R	F Channel Number		1	Only one TDD carrier frequency is used.
Channel Ba	andwidth (BW _{channel})	MHz	10	
Time offset	t between cells	μs	3	Synchronous cells
Access Ba	rring Information	-	Not Sent	No additional delays in random access procedure.
Special sub	oframe configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-dow	nlink configuration		1	As specified in table 4.2-2 in TS 36.211
PRACH co	nfiguration index		53	As specified in table 5.7.1-3 in TS 36.211
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		S	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
Т3		S	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.2.2.1-2: Cell specific test parameters for TDD intra frequency cell re-selection test case in **AWGN**

Parameter	Unit		Cell 1		Cell 2				
		T1	T2	Т3	T1	T2	T3		
E-UTRA RF Channel			1			1			
Number									
BW _{channel}	MHz		10			10			
OCNG Pattern									
defined in A.3.2.2.2		OF	P.2 TDD		Ol	P.2 TDD			
(OP.2 TDD)									
PBCH_RA									
PBCH_RB									
PSS_RA									
SSS_RA									
PCFICH_RB									
PHICH_RA									
PHICH_RB	dB		0			0			
PDCCH_RA									
PDCCH_RB									
PDSCH_RA									
PDSCH_RB									
OCNG_RA ^{Note 1}									
OCNG_RB ^{Note 1}									
Qrxlevmin	dBm		-140			-140			
Pcompensation	dB		0			0			
Qhyst _s	dB		0			0			
Qoffset _{s, n}	dB	0				0			
Cell_selection_and_									
reselection_quality_		1	RSRP			RSRP			
measurement									
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	16	-3.11	2.79	-infinity	2.79	-3.11		
	dBm/15 kHz				98				
$N_{oc}^{ m Note2}$	dBilly 10 Ki iz				00				
\hat{E}_s/N_{oc}	dB	16	13	16	-infinity	16	13		
RSRP Note3	dBm/15 kHz	-82	-85	-82	-infinity	-82	-85		
Treselection	S	0	0	0	0	0	0		
Sintrasearch	dB	N	ot sent		N	lot sent			
Propagation		_		AV	VGN				
Condition									
Note 1: OCNG shall	be used such that	t both cells a	are fully a	allocated	and a cons	tant total			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.									

Interference from other cells and noise sources not specified in the test is assumed to Note 2: be constant over subcarriers and time and shall be modelled as AWGN of appropriate

power for N_{oc} to be fulfilled.

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

A.4.2.2.2 **Test Requirements**

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

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

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

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

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

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

Where:

 $T_{detect,EUTRAN_Intra}$ See Table 4.2.2.3-1 in clause 4.2.2.3

 $T_{evaluate,E-UTRAN\ intra}$ See Table 4.2.2.3-1 in clause 4.2.2.3

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

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

A.4.2.3 E-UTRAN FDD – FDD Inter frequency case

A.4.2.3.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD inter-frequency cell reselection requirements specified in clause 4.2.2.4.

The test scenario comprises of 2 E-UTRA FDD cells on 2 different carriers as given in tables A.4.2.3.1-1 and A.4.2.3.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.3.1-1: General test parameters for FDD-FDD inter frequency cell re-selection test case

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

Table A.4.2.3.1-2: Cell specific test parameters for FDD-FDD inter-frequency cell reselection test case in AWGN

Parameter	Unit	(Cell 1			Cell 2			
		T1	T2	T3	T1 T2 T3				
E-UTRA RF Channel			1		2				
number									
BW _{channel}	MHz		10			10			
OCNG Patterns defined in									
A.3.2.1.2 (OP.2 FDD)		OP	.2 FDD			OP.2 FDD			
PBCH_RA	dB								
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB		_			_			
PHICH_RB	dB		0			0			
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA ^{Note 1}	dB								
OCNG_RB ^{Note 1}	dB								
Qrxlevmin	dBm	-140				-140			
$N_{oc}^{$	dBm/15 kHz				-98				
RSRP Note 3	dBm/15 KHz	-84	-84	-84	-102	-infinity	-86		
\hat{E}_{s}/I_{ot}	dB	14	14	14	-4	-infinity	12		
\hat{E}_s/N_{oc}	dB	14	14	14	-4	-infinity	12		
Treselection _{EUTRAN}	S	0 0							
Snonintrasearch	dB	50 Not sent							
Thresh _{x, high}	dB		48	•		48			
Thresh _{serving, low}	dB		44						
Thresh _{x, low}	dB		50		50				
Propagation Condition					AWGN				

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

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

A.4.2.3.2 Test Requirements

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

The cell re-selection delay to higher priority shall be less than 68 s.

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

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

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher_priority_search} + T_{evaluateFDD,inter} + T_{SI}$, and to lower priority cell can be expressed as: $T_{evaluateFDD,inter} + T_{SI}$,

Where:

 $T_{higher_priority_search}$ See clause 4.2.2

T_{evaluateFDD,inter} See Table 4.2.2.4-1 in clause 4.2.2.4

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

A.4.2.4 E-UTRAN FDD – TDD Inter frequency case

A.4.2.4.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-TDD inter-frequency cell reselection requirements specified in clause 4.2.2.4.

The test scenario comprises of 1 E-UTRA FDD cell and 1 E-UTRA TDD cell as given in tables A.4.2.4.1-1 and A.4.2.4.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.4.1-1: General test parameters for FDD-TDD inter frequency cell re-selection test case

	Parameter	Unit	Value	Comment		
Initial	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation		
condition				phase, so that reselection to cell 1 occurs during		
				the first T1 phase		
T1 end	Active cell		Cell1	UE shall perform reselection to cell 1 during T1		
condition	Neighbour cell		Cell2			
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3		
Cell 1 E-U7	TRA RF Channel		1	One FDD carrier frequency is used. And Cell 1 is		
Number				on RF channel number 1.		
Cell 2 E-U7	TRA RF Channel		2	One TDD carrier frequencies is used. And Cell 2		
Number				is on RF channel number 2.		
Time offset	between cells		3 ms	Asynchronous cells		
E-UTRA F	DD PRACH		4	As specified in table 5.7.1-2 in TS 36.211		
configuration						
_	DD PRACH		53	As specified in table 5.7.1-3 in TS 36.211		
configuration						
	oframe configuration		6	As specified in table 4.2-1 in TS 36.211		
Uplink-dow	nlink configuration		1	As specified in table 4.2-2 in TS 36.211		
E-UTRA F	DD Access Barring	-	Not Sent	No additional delays in random access		
Information				procedure.		
	DD Access Barring	-	Not Sent	No additional delays in random access		
Information				procedure.		
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.		
T1		S	15	T1 need to be defined so that cell re-selection		
				reaction time is taken into account.		
T2		S	>7	During T2, cell 2 shall be powered off, and		
				during the off time the physical cell identity shall		
				be changed, The intention is to ensure that cell 2		
				has not been detected by the UE prior to the		
				start of period T3.		
T3		s	75	T3 need to be defined so that cell re-selection		
				reaction time is taken into account.		

Table A.4.2.4.1-2: Cell specific test parameters for FDD-TDD inter-frequency cell reselection test case in AWGN

Parameter	Unit	(Cell 1			Cell 2		
		T1	T2	T3	T1			
E-UTRA RF Channel		1			2			
number								
BW _{channel}	MHz		10			10		
OCNG Patterns defined in								
A.3.2.1.2 (OP.2 FDD) and		OP	.2 FDD			OP.2 TDD		
A.3.2.2.2 (OP.2 TDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB		_					
PHICH_RB	dB		0			0		
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
Qrxlevmin	dBm		-140			-140		
$N_{oc}^{$	dBm/15 kHz				-98			
RSRP Note 3	dBm/15 KHz	-84	-84	-84	-102	-infinity	-86	
$\hat{ extsf{E}}_{ extsf{s}}/ extsf{I}_{ ext{ot}}$	dB	14	14	14	-4	-infinity	12	
\hat{E}_s/N_{oc}	dB	14 14 14 -4 -infinity		12				
Treselection _{EUTRAN}	S		0 0					
Snonintrasearch	dB		50		Not sent			
Thresh _{x, high}	dB		48			48		
Thresh _{serving, low}	dB		44			44		
Thresh _{x, low}	dB		50			50		
Propagation Condition					AWGN	-	·	

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

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

A.4.2.4.2 Test Requirements

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

The cell re-selection delay to higher priority shall be less than 68 s.

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

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

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher_priority_search} + T_{evaluate,E-}$ $UTRAN_inter + T_{SI-EUTRA}$, and to lower priority cell can be expressed as: $T_{evaluate,E-UTRAN_inter} + T_{SI-EUTRA}$,

Where:

 $T_{higher_priority_search}$ See clause 4.2.2

T_{evaluate,E-UTRAN_inter} See Table 4.2.2.4-1 in clause 4.2.2.4

T_{SI-EUTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

A.4.2.5 E-UTRAN TDD – FDD Inter frequency case

A.4.2.5.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-FDD inter-frequency cell reselection requirements specified in clause 4.2.2.4.

The test scenario comprises of 1 E-UTRA TDD cell and 1 E-UTRA FDD cell as given in tables A.4.2.5.1-1 and A.4.2.5.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.5.1-1: General test parameters for TDD-FDD inter frequency cell re-selection test case

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

Table A.4.2.5.1-2: Cell specific test parameters for TDD-FDD inter-frequency cell reselection test case in AWGN

Parameter	Unit	C	ell 1			Cell 2		
		T1	T2	T3	T1			
E-UTRA RF Channel		1 2						
number								
BW _{channel}	MHz		10			10		
OCNG Patterns defined in								
A.3.2.1.2 (OP.2 FDD) and		OP	.2 TDD			OP.2 FDD		
A.3.2.2.2 (OP.2 TDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB		_			_		
PHICH_RB	dB		0			0		
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
Qrxlevmin	dBm		140			-140		
$N_{oc}^{ m Note~2}$	dBm/15 kHz				-98			
RSRP Note 3	dBm/15 KHz	-84	-84	-84	-102	-infinity	-86	
\hat{E}_{s}/I_{ot}	dB	14	14	14	-4	-infinity	12	
\hat{E}_s/N_{oc}	dB	14	14	14	-4	-infinity	12	
Treselection _{EUTRAN}	S	0 0						
Snonintrasearch	dB		50			Not sent		
Thresh _{x, high}	dB		48			48		
Thresh _{serving, low}	dB		44			44		
Thresh _{x, low}	dB		50			50		
Propagation Condition				<u> </u>	AWGN			

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

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

A.4.2.5.2 Test Requirements

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

The cell re-selection delay to higher priority shall be less than 68 s.

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

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

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher_priority_search} + T_{evaluate,E-}$ $UTRAN_inter + T_{SI-EUTRA}$, and to lower priority cell can be expressed as: $T_{evaluate,E-UTRAN_inter} + T_{SI-EUTRA}$,

Where:

 $T_{higher_priority_search}$ See clause 4.2.2

T_{evaluate,E-UTRAN_inter} See Table 4.2.2.4-1 in clause 4.2.2.4

T_{SI-EUTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

A.4.2.6 E-UTRAN TDD – TDD: Inter frequency case

A.4.2.6.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD inter-frequency cell reselection requirements specified in clause 4.2.2.4.

The test scenario comprises of 2 E-UTRA TDD cells on 2 different carriers as given in tables A.4.2.6.1-1 and A.4.2.6.1-2. The test consists of three successive time periods, with time duration of T1, T2, and T2 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.6.1-1: General test parameters for TDD-TDD inter frequency cell reselection test case

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

Table A.4.2.6.1-2: Cell specific test parameters for TDD-TDD inter-frequency cell reselection test case in AWGN

Parameter	Unit	(Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			2	
number							
BW _{channel}	MHz		10			10	
OCNG Pattern defined in							
A.3.2.2.2 (OP.2 TDD)		OF	2.2 TDD		0	P.2 TDD	
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB					_	
PHICH_RA	dB		0			0	
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
Qrxlevmin	dBm		-140			-140	
$N_{oc}^{ m Note~2}$	dBm/15 kHz			-	.98		
RSRP Note 3	dBm/15 KHz	-84	-84	-84	-102	-infinity	-86
\hat{E}_{s}/I_{ot}	dB	14	14	14	-4	-infinity	12
\hat{E}_s/N_{oc}	dB	14	14	14	-4	-infinity	12
Treselection _{EUTRAN}	S		0			0	
Snonintrasearch	dB		50		1	Not sent	
Thresh _{x, high}	dB		48			48	
Thresh _{serving, low}	dB		44			44	
Thresh _{x, low}	dB		50			50	
Propagation Condition		-		AV	VGN		

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

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

A.4.2.6.2 Test Requirements

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

The cell re-selection delay to higher priority shall be less than 68 s.

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

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

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher_priority_search} + T_{evaluate,E-UTRAN_inter} + T_{SI-EUTRA}$, and to lower priority cell can be expressed as: $T_{evaluate,E-UTRAN_inter} + T_{SI-EUTRA}$,

Where:

 $T_{higher_priority_search}$ See clause 4.2.2

 $T_{evaluate, E\text{-}UTRAN_inter} \quad See\ Table\ 4.2.2.4\text{-}1\ in\ clause}\ 4.2.2.4$

T_{SI-EUTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

A.4.2.7 E-UTRAN FDD – FDD Inter frequency case in the existence of nonallowed CSG cell

A.4.2.7.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD inter-frequency cell reselection requirements specified in clause 4.2.2.4 when there is the interference from non-allowed CSG cell and the layers have equal priority.

The test scenario comprises of 2 E-UTRA FDD cells on 2 different carriers and 1 non-allowed E-UTRA FDD CSG cell as given in tables A.4.2.7.1-1 and A.4.2.7.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Cell 1 is already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 3 is a non-allowed CSG cell. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.7.1-1: General test parameters for FDD-FDD inter frequency cell re-selection test case with non-allowed CSG cell

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

Table A.4.2.7.1-2: Cell specific test parameters for FDD-FDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit		Cell 1			Cell 2		Cell 3	(Non-allov cell)	wed CSG			
		T1	T2	T3	T1	T2	Т3	T1	T2	Т3			
E-UTRA RF Channel Number			1			2		1					
BW _{channel}	MHz		10			10			10				
OCNG Patterns defined in A.3.2.1.2 (OP.2 FDD)			OP.2 FDI)	Ol	P.2 FDD)		OP.2 FD	D			
PBCH_RA	dB												
PBCH_RB	dB												
PSS_RA	dB												
SSS_RA	dB												
PCFICH_RB	dB												
PHICH_RA	dB												
PHICH_RB	dB		_			_			_				
PDCCH_RA	dB		0			0			0				
PDCCH_RB	dB												
PDSCH_RA	dB												
PDSCH_RB	dB												
OCNG_RA ^{Note 1}	dB												
OCNG_RB ^{Note 1}	dB												
Qrxlevmin	dBm		-140			-140			-140				
Qqualmin	dB				-1	-20		I					
$N_{oc}^{ m Note~2}$	dBm/15 kHz					-98							
RSRP Note 3	dBm/15 kHz	-90	-90	-85	-Infinity	-85	-90	-90	-85	-60			
RSRQ Note 3	dB	-14.1	-17.1	-35.8				-14.1	-12.1	-10.8			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	-0.64	-5.21	-25	-Infinity	13	8	-0.64	4.36	24.8			
\hat{E}_s/N_{oc}	dB	8	8	13	-Infinity	13	8	8	13	38			
Treselection	S		0			0		0					
Snonintrasearch	dB		-10		Not sent			Not sent					
Propagation Condition				<i>f</i>		AWGN							

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

A.4.2.7.2 Test Requirements

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

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

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

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

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{\text{detect}, \text{EUTRAN_Inter}} + T_{\text{SI}}$,

Where:

T_{detect,EUTRAN Inter} See Table 4.2.2.4-1 in clause 4.2.2.4

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

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

A.4.2.8 E-UTRAN TDD – TDD Inter frequency case in the existence of nonallowed CSG cell

A.4.2.8.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD inter-frequency cell reselection requirements specified in clause 4.2.2.4 when there is the interference from non-allowed CSG cell and the layers have equal priority.

The test scenario comprises of 2 E-UTRA TDD cells on 2 different carriers and 1 non-allowed E-UTRA TDD CSG cell as given in tables A.4.2.8.1-1 and A.4.2.8.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Cell 1 is already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 3 is a non-allowed CSG cell. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.8.1-1: General test parameters for TDD-TDD inter frequency cell re-selection test case with non-allowed CSG cell

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

Table A.4.2.8.1-2: Cell specific test parameters for TDD-TDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit		Cell 1		С	ell 2			Cell 3		
		T4 T0 T0							llowed CS		
		T1	T2	Т3	T1	T2	T3	T1	T2	Т3	
E-UTRA RF Channel			1			2			1		
Number											
BW _{channel}	MHz		10			10			10		
OCNG Pattern defined in			OP.2 TDI	`	OΒ	2 TDD			OP.2 TDD		
A.3.2.2.2 (OP.2 TDD)		`	JF.Z 1DL		OF.	2 100			OF.Z TDD	'	
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB		0			0			0		
PDCCH_RA	dB										
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA ^{Note 1}	dB										
OCNG_RB ^{Note 1}	dB										
Qrxlevmin	dBm		-140		_	140			-140		
Qqualmin	dB				•	-20		•			
Note 2	dBm/					-98					
	15kHz										
RSRP Note 3	dBm/	-90	-90	-85	-Infinity	-85	-90	-90	-85	-60	
	15kHz				-						
RSRQ Note 3	dB	-14.1	-17.1	-35.8				-14.1	-12.1	-10.8	
\hat{E}_s/I_{ot}	dB	-0.64	-5.21	-25	-Infinity	13	8	-0.64	4.36	24.8	
\hat{E}_s/N_{oc}	dB	8	8	13	-Infinity	13	8	8	13	38	
Treselection	S		0	•		0		0			
Snonintrasearch	dB		-10		No	t sent			Not sent		
Propagation Condition		AWGN									
Nete 4: OONO electric	·	414141-		£							

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over

subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

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

A.4.2.8.2 Test Requirements

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

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

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

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{\text{detect,EUTRAN_Inter}} + T_{\text{SI}}$,

Where:

T_{detect.EUTRAN Inter} See Table 4.2.2.4-1 in clause 4.2.2.4

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

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

A.4.2.9 E-UTRAN FDD – FDD Intra frequency case for 5MHz bandwidth

A.4.2.9.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.4.2.1.1.

The parameters of this test are the same as defined in Subclause A.4.2.1.1 except that the values of the parameters in the Table A.4.2.9.1-1 will replace the values of the corresponding parameters in A.4.2.1.1-1, and the values of the parameters in the Table A.4.2.9.1-2 will replace the values of the corresponding parameters in A.4.2.1.1-2.

Table A.4.2.9.1-1: General test parameters for FDD intra frequency cell reselection test case for 5MHz bandwidth

Parameter	Unit	Value	Comment						
Channel Bandwidth (BW _{channel})	MHz	5							
Note 1: See Table A.4.2.1.1-1	1-1 for the other parameters.								
Note 2: This is according to the	This is according to the principle defined in section A.3.7.2.								

Table A.4.2.9.1-2: Cell specific test parameters for FDD intra frequency cell reselection test case in AWGN for 5MHz

Parameter	Unit		Cell 1			Cell 2				
		T1	T2	Т3	T1	T2	T3			
BW _{channel}	MHz		5			5				
OCNG Patterns										
defined in A.3.2.1.16		0	P.16 FDD			OP.16 FD	D			
(OP.16 FDD)										
Note 1: OCNG shall	he used such that	ich that both cells are fully allocated and a constant total transmitted power								

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

Note 2: See Table A.4.2.1.1-2 for the other parameters.

A.4.2.9.2 Test Requirements

The test requirements defined in section A.4.2.1.2 shall apply to this test case.

A.4.2.10 E-UTRAN FDD – FDD reselection using an increased number of carriers

A.4.2.10.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD inter-frequency cell reselection requirements for increased UE carrier monitoring specified in clause 4.2.2.4.

The test scenario comprises of indicating 8 E-UTRA FDD interfrequency cells on 8 different carriers in the neighbour list of cell 1 as given in tables A.4.2.10.1-1 and A.4.2.10.1-2. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3 and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (serving cell), and selects frequencies for cells 2, 3 and 4 which are chosen from the 8 intefrequency layers which are configured in the UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2, 3 and 4 shall include the frequency of cell 1 in the normal performance group as well as the other frequencies configured to the UE in the test.

Cell 1, 2, 3 and 4 are identified by the UE during time phase T0. Cell 1, cell 2, cell 3 and cell 4 all belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2, 3 or 4. Cells 1, 2, 3 and 4 all have equal absolute priority.

Table A.4.2.10.1-1: General test parameters for FDD-FDD inter frequency cell re-selection test case

Param	eter	Unit	Value	Comment			
ТО	Active cell		Cell1	To is repeated on each repetition of the test. In To the test equipment selects frequencies for cell 2, 3, 4 and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.			
T1 start condition	Active cell		Cell 1				
T1 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T1			
	Neighbour cell		Cell 1, cell 3, cell 4				
T2 end condition	Active cell		Cell 3	UE shall perform reselection to cell 3 during T2			
	Neighbour cell		Cell 1, cell 2, cell 4				
T3 end condition	Active cell		Cell 4	UE shall perform reselection to cell 4 during T3			
	Neighbour cell		Cell 1, cell 2, cell 3				
T4 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T4			
	Neighbour cell		Cell 2, cell 3, cell 4				
UE configured E-U Channel Number	TRA RF		1, 2,3,4,5,6,7,8,9	Serving cell and eight xDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are indicated to have reduced performance			
Test eqipment conf	ga a.c.		Cell 1 uses UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9				
PRACH configuration	on		4	As specified in table 5.7.1-2 in TS 36.211 [16]			
Access Barring Info	ormation	-	Not Sent	No additional delays in random access procedure.			
DRX cycle length		S	1.28	The value shall be used for all cells in the test.			
ТО		S	(Test equipment frequency selection and configuration time) + 960	To is defined so that the Test equipment selects frequencies and configures the cells, then the UE cell detection time is taken into account.			
T1		S	25	T1 need to be defined so that cell reselection reaction time is taken into account.			
T2		S	200	T2 need to be defined so that cell re- selection reaction time is taken into account			
T3		S	200	T3 need to be defined so that cell reselection reaction time is taken into account			
T4		S	25	T4 need to be defined so that cell re- selection reaction time is taken into account			

Table A.4.2.10.1-2: Cell specific test parameters for FDD-FDD inter-frequency cell reselection test case in AWGN

Parameter	Unit			Cell 1					Cell 2				Cel	I 3			Cel	4	
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4	T0	T1	T2
E-UTRA RF Channel				1			Ran	domly s	elected	2,3,4	Rand	omly se	lected	from	Randomly selected from				
number							such	such that cell 2 is in the normal					8,9 suc	h that o	cell 3	5,6,7,8,9 such that cell 4			
								perfor	mance	group		is	in the r	educed	t	is in the reduced			
													forman			performance group			
BW _{channel}	MHz			Iz: N _{RB}					Iz: N _{RB,}				MHz: N				MHz: N		
				Hz: N _{RB}					Iz: N _{RB}				MHz: N				MHz: N		
OCNG patterns				FDD (FDD (.16 FDI				.16 FDI		
			OP.2 I	FDD (1	0MHz)			OP.2 I	FDD (1	OMHz)		OP	.2 FDD	(10MH	lz)	OP	.2 FDD	(10MH	z)
PBCH_RA	dB			0					0				0				0		
PBCH_RB	dB																		
PSS_RA	dB																		
SSS_RA	dB																		
PCFICH_RB	dB																		
PHICH_RA	dB																		
PHICH_RB	dB																		
PDCCH_RA	dB																		
PDCCH_RB	dB																		
PDSCH_RA	dB																		
PDSCH_RB	dB																		
OCNG_RA ^{Note 1}	dB																		
OCNG_RB ^{Note 1}	dB																		
Qrxlevmin	dBm			-140			-140					-140				-140			
$N_{oc}^{ m Note~2}$	dBm/15			-98					-98				-98	8			-98	3	
1 voc	kHz																		
\hat{E}_s/N_{oc}	dB	14	8	8	8	14	8	14	8	8	8	8	8	14	8	8	8	8	8
\hat{E}_s/I_{ot}	dB	14	8	8	8	14	8	14	8	8	8	8	8	14	8	8	8	8	8
RSRP Note 3	dBm/15	-84	-90	-90	-90	-84	-90	-84	-90	-90	-90	-90	-90	-84	-90	-90	-90	-90	-90
	kHz																		
Treselection _{EUTRAN}	S	0					0				0				0				
Snonintrasearch	dB	62					62				62				62				
Propagation Condition		AWGN				AWGN				AWGN				AWGN					
Antenna Configuration		1x2				1x2				1x2				1x2					
Timing offset to Cell 1							3ms				3ms				3ms				

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

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

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

A.4.2.10.2 Test Requirements

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

The reselection delays shall meet the requirements in table A.4.2.10.2-1.

Table A.4.2.10.2-1: Reselection delay requirements

Time phase	Target cell	Requirement for reselection delay (seconds)
T1	Cell 2 (normal performance group)	20.5
T2	Cell 3 (reduced performance group)	193.3
T3	Cell 4 (reduced performance group)	193.3
T4	Cell 1 (normal performance group)	20.5

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $K_{carrier,normal} * T_{evaluate,E-UTRAN_Inter}, + T_{SI}$, and to a reduced performance group cell can be expressed as: $6*K_{carrier,reduced} * T_{evaluate,E-UTRAN_Inter}, + T_{SI}$,

This gives a total of 20.48 s for normal performance group reselection and 193.28 s for reduced performance group reselection, allow 20.5 s for normal performance group and 193.3 s for reduced performance group in the test case. At least 90% of reselections to the reduced performance group shall be within the required time, and at least 90% of reselections to the normal performance group shall be within the required time, with a successful reselection counted if it is within the required time regardless of the carrier frequencies involved.

A.4.2.11 E-UTRAN TDD – TDD reselection using an increased number of carriers

A.4.2.11.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD inter-frequency cell reselection requirements for increased UE carrier monitoring specified in clause 4.2.2.4.

The test scenario comprises of indicating 8 E-UTRA TDD interfrequency cells on 8 different carriers in the neighbour list of cell 1 as given in tables A.4.2.11.1-1 and A.4.2.11.1-2. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3 and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (serving cell), and selects frequencies for cells 2, 3 and 4 which are chosen from the 8 intefrequency layers which are configured in the UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2, 3 and 4 shall include the frequency of cell 1 in the normal performance group as well as the other frequencies configured to the UE in the test.

Cell 1, 2, 3 and 4 are identified by the UE during time phase T0. Cell 1, cell 2, cell 3 and cell 4 all belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2, 3 or 4. Cells 1, 2, 3 and 4 all have equal absolute priority.

Table A.4.2.11.1-1: General test parameters for TDD-TDD inter frequency cell re-selection test case

Para	meter	Unit	Value	Comment
T0			Cell1	T0 is repeated on each repetition of the test. In T0 the test equipment selects frequencies for cell 2,3,4 and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition T1 end condition		1	Cell 1 Cell 2	
i i ena condition				UE shall perform reselection to cell 2 during T1
TO 1 1111	Neighbour cell		Cell 1, cell 3, cell 4	115 1 11 (1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
T2 end condition	Active cell		Cell 3	UE shall perform reselection to cell 3 during T2
To 1 1111	Neighbour cell		Cell 1, cell 2, cell 4	115 1 11 6 1 11 11 11
T3 end condition	Active cell		Cell4	UE shall perform reselection to cell 4 during T3
	Neighbour cell		Cell 1, cell 2, cell 3	
T4 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T4
	Neighbour cell	1	Cell 2, cell 3, cell 4	
UE configured E-UT Number	RA RF Channel		1, 2,3,4,5,6,7,8,9	Serving cell and eight xDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are indicated to have reduced performance
Test eqipment confi	guratori		Cell 1 uses UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9	
PRACH configuration	on		4	As specified in table 5.7.1-2 in TS 36.211 [16]
Access Barring Info	rmation	-	Not Sent	No additional delays in random access procedure.
DRX cycle length		S	1.28	The value shall be used for all cells in the test.
ТО		S	(Test equipment frequency selection and configuration time) + 960	To is defined so that the Test equipment selects frequencies and configures the cells, then the UE cell detection time is taken into account.
T1		S	25	T1 need to be defined so that cell reselection reaction time is taken into account.
T2		S	200	T2 need to be defined so that cell re- selection reaction time is taken into account
Т3		S	200	T3 need to be defined so that cell reselection reaction time is taken into account.
T4		S	25	T4 need to be defined so that cell re- selection reaction time is taken into account

Table A.4.2.11.1-2: Cell specific test parameters for TDD-TDD inter-frequency cell reselection test case in AWGN

Parameter	Unit			Cell 1					Cell 2				Ce	II 3			Ce	II 4	
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4	-		
E-UTRA RF Channel				1			Rando	omly selec	cted from	2,3,4 su	ch that	Randon	nly select	ed from 5	5,6,7,8,9	Randomly selected from 5,6,7,8,9			
number							cell 2 is	s in the n	ormal pe	rformance	group	such th	at cell 3 i	s in the r	educed	such that cell 4 is in the reduced			
													performa	nce grou	р	performance group			
BW _{channel}	MHz		_	Iz: N _{RB} :	-				Hz: N _{RB,} =				5MHz: N			5MHz: N _{RB} = 25			
				Hz: N _{RB}					IHz: N _{RB,}				10MHz:			10MHz: N _{RB,} = 50			
OCNG Patterns				: OP.10					z: OP.10				5MHz: OI				5MHz: O		
			10MF	lz: OP.2	2 TDD			10MI	dz: OP.2	TDD			10MHz: ()		10MHz: ()
PBCH_RA	dB			0					0				()			(0	
PBCH_RB	dB																		
PSS_RA	dB																		
SSS_RA	dB																		
PCFICH_RB	dB																		
PHICH_RA	dB																		
PHICH_RB	dB																		
PDCCH_RA	dB																		
PDCCH_RB	dB																		
PDSCH_RA	dB																		
PDSCH_RB	dB																		
OCNG_RA ^{Note 1}	dB																		
OCNG_RB ^{Note 1}	dB																		
Qrxlevmin	dBm			-140					-140				-1-	40			-1	40	
$N_{oc}^{ m Note~2}$	dBm15			-98					-98				-6	98			-(98	
¹ v oc	kHz																		
\hat{E}_s/N_{oc}	dB	14	8	8	8	14	8	14	8	8	8	8	8	14	8	8	8	8	8
\hat{E}_{s}/I_{ot}	dB	14	8	8	8	14	8	14	8	8	8	8	8	14	8	8	8	8	8
RSRP Note 3	dBm/15	-84	-90	-90	-90	-84	-90	-84	-90	-90	-90	-90	-90	-84	-90	-90	-90	-90	-90
	kHz																		<u> </u>
Treselection _{EUTRAN}	S			0					0			0				0			
Snonintrasearch	dB			62	•	•	62				62				62				
Propagation Condition				AWGN				AWGN				AWGN				AWGN			
Antenna Configuration				1x2			1x2				1x2				1x2				
Timing offset to Cell 1				-					3ms			3ms				3ms			
		- 414 1-	that both calls are fully allegated and					. 4 4 - 4 - 1 4											

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

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

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

A.4.2.11.2 Test Requirements

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

The reselection delays shall meet the requirements in table A.4.2.11.2-1

Table A.4.2.11.2-1: Reselection delay requirements

Time phase	Target cell	Requirement for reselection delay (seconds)
T1	Cell 2 (normal performance group)	20.5
T2	Cell 3 (reduced performance group)	193.3
T3	Cell 4 (reduced performance group)	193.3
T4	Cell 1 (normal performance group)	20.5

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $K_{carrier,normal} * T_{evaluate,E-UTRAN_Inter}, + T_{SI}$, and to a reduced performance group cell can be expressed as: $6* K_{carrier,reduced} * T_{evaluate,E-UTRAN_Inter}, + T_{SI}$,

This gives a total of 20.48 s for normal performance group reselection and 193.28 s for reduced performance group reselection, allow 20.5 s for normal performance group and 193.3 s for reduced performance group in the test case. At least 90% of reselections to the reduced performance group shall be within the required time, and at least 90% of reselections to the normal performance group shall be within the required time, with a successful reselection counted if it is within the required time regardless of the carrier frequencies involved.

A.4.3 E-UTRAN to UTRAN Cell Re-Selection

A.4.3.1 E-UTRAN FDD – UTRAN FDD:

A.4.3.1.1 EUTRA FDD-UTRA FDD cell reselection: UTRA FDD is of higher priority

A.4.3.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRA FDD- UTRA FDD inter-RAT cell reselection requirements specified in clause 4.2.2.5 when the UTRA cell is of higher priority.

The test scenario comprises of one E-UTRA FDD and one UTRA FDD cells as given in tables A.4.3.1.1.1-1, A.4.3.1.1.1-2 and A.4.3.1.1.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. E-UTRA cell 1 is already identified by the UE prior to the start of the test. Cell 2 is of higher priority than cell 1.

Table A.4.3.1.1.1-1: General test parameters for E-UTRA FDD- higher priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment	
Initial condition	Active cell		Cell 1	UE is on cell 1 in the initialisation phase, so that reselection to cell 2 occurs during T2	
T2 end	Active cell		Cell 2	UE shall perform reselection to cell 2 during T2	
condition	Neighbour cell		Cell 1		
T3 end	Active cell		Cell 1	UE shall perform reselection to cell 1 during T3	
condition	Neighbour cell		Cell 2		
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211	
E_UTRA Access Barring		-	Not Sent	No additional delays in random access	
Information				procedure.	
DRX cycle length		S	1.28	The value shall be used for all cells in the test.	
T1		S	>20	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed. The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.	
T2		s	85	T2 needs to be defined so that cell re-selection reaction time is taken into account.	
T3		S	25	T3 need to be defined so that cell re-selection reaction time is taken into account.	

Table A.4.3.1.1.1-2: Cell specific test parameters for cell 1(E-UTRA)

Parameter	Unit	Cell 1						
		T1	T2	T3				
E-UTRA RF Channel		1						
number								
BW _{channel}	MHz	10						
OCNG Patterns defined in								
A.3.2.1.2 (OP.2 FDD)		OP.2 FDD						
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB	0						
PHICH_RA	dB							
PHICH_RB	dB							
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
Qqualmin for UTRA	dB	-20						
neighbour cell	uБ	-20						
Qrxlevmin for UTRA	dBm	-115						
neighbour cell								
Qrxlevmin	dBm	-140						
N_{oc}	dBm/15 kHz	-98						
RSRP	dBm/15 KHz	-84	-84	-84				
\hat{E}_{s}/I_{ot}	dB	14	14	14				
\hat{E}_s/N_{oc}	dB	14	14	14				
Treselection _{EUTRAN}	S	0						
Snonintrasearch	dB	50						
Thresh _{x, high} (Note 2)	dB	40						
Propagation Condition		AWGN						

Note 2: This refers to the value of Thresh_{x, high} which is included in E-UTRA system information, and is a threshold for the UTRA target cell

Table A.4.3.1.1.1-3: Cell specific test parameters for cell 2(UTRA)

Unit	Ce	(A)	
	T1	T2	Т3
	Channel	2	
dB	-10		
dB	-12		
dB	-12		
dB	-15		
dB	-0.941		
dB	-Infinity	11	-5
dBm/3,84 MHz	-70		
dB	-Infinity	-10.33	-16.19
dBm	-Infinity	-69	-85
	AWGN		
dB	-20		
dBm	-115		
dBm	-140		
dBm	21		
S	0		
dB	62		
dB	0		
dB	36		
dB	50		
	dB d	T1 Channel dB -10 dB -12 dB -15 dB -0.941 dB -Infinity dBm/3,84 MHz -70 dB -Infinity dBm -Infinity AWGN AWGN dB -20 dBm -115 dBm -140 dBm 21 s 0 dB 62 dB 0 dB 36 dB 50	T1 T2 Channel 2 dB -10 dB -12 dB -15 dB -0.941 dB -Infinity 11 dBm/3,84 MHz -70 dB -Infinity -10.33 dBm -Infinity -69 AWGN dB -20 dBm -115 dBm -140 dBm 21 s 0 dB 62 dB 0 dB 36

Note 1: his refers to the value of Thresh_{x, low} which is included in UTRA system information, and is a threshold for the E-UTRA target

A.4.3.1.1.2 Test Requirements

The cell reselection delay to higher priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to higher priority shall be less than 81 s.

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher_priority_search} + T_{evaluateUTRA_FDD} + T_{SI-UTRA}$

Where:

T_{higher_priority_search} See clause 4.2.2; 60s is assumed in this test case

T_{evaluateUTRA-FDD} See Table 4.2.2.5.1-1

T_{SI-UTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 80.48 s for higher priority cell search, allow 81 s for higher priority cell reselection in the test case.

A.4.3.1.2 EUTRA FDD-UTRA FDD cell reselection: UTRA FDD is of lower priority

A.4.3.1.2.1 Test Purpose and Environment

This test is to verify the requirement for the EUTRA FDD- UTRA FDD inter-RAT cell reselection requirements specified in clause 4.2.2.5.1 when the UTRA cell is of lower priority.

The test scenario comprises of one UTRA FDD and one E-UTRA FDD cells as given in tables A.4.3.1.2.1-1, A.4.3.1.2.1-2 and A.4.3.1.2.1-3. The test consists of two successive time periods, with time duration of T1 and T2

respectively. Both E-UTRA cell 1 and UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1.

Table A.4.3.1.2.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
condition	Neighbour cell		Cell1	
E-UTRA P	RACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA A Information	ccess Barring	-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1	_	S	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		S	25	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.3.1.2.1-2: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit		Cell 1
		T1	T2
E-UTRA RF Channel			1
number			
BW _{channel}	MHz		10
OCNG Patterns defined in			
A.3.2.1.2 (OP.2 FDD)		OI	P.2 FDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		0
PHICH_RB	dB		0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
Qqualmin for UTRA	dB		-20
neighbour cell	uБ		-20
Qrxlevmin for UTRA	dBm		-115
neighbour cell			
Qrxlevmin	dBm		-140
N_{oc}	dBm/15 kHz		-98
RSRP	dBm/15 KHz	-86	-102
\hat{E}_{s}/I_{ot}	dB	12	-4
\hat{E}_s/N_{oc}	dB	12	-4
Treselection _{EUTRAN}	S	0	
Snonintrasearch	dB	N	lot sent
Thresh _{serving, low}	dB	44	
Thresh _{x, low} (Note 2)	dB	42	
Propagation Condition			AWGN

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

Note 2: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA target cell

Table A.4.3.1.2.1-3: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2	(UTRA)			
		T1	T2			
UTRA RF Channel Number		Channel 2	2			
CPICH_Ec/lor	dB	-10				
PCCPCH_Ec/lor	dB	-12				
SCH_Ec/lor	dB	-12				
PICH_Ec/lor	dB	-15				
OCNS_Ec/lor	dB	-0.941				
\hat{I}_{or}/I_{oc}	dB	13	13			
I_{oc}	dBm/3,84 MHz	-70				
CPICH_Ec/Io	dB	-10.21	-10.21			
CPICH_RSCP	dBm	-67	-67			
Propagation Condition		AWGN				
Qqualmin	dB	-20				
Qrxlevmin	dBm	-115				
QrxlevminEUTRA	dBm	-140				
UE_TXPWR_MAX_RACH	dBm	21				
Treselection	S	0				
Sprioritysearch1	dB	42	·			
Sprioritysearch2	dB	0	·			
Thresh _{x, high} (Note 1)	dB	48				
Note 1: This refers to the value of Thresh _{x, high} which is included						

Note 1: This refers to the value of Thresh_x, high which is included in UTRA system information, and is a threshold for the E-UTRA target cell

A.4.3.1.2.2 Test Requirements

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA_FDD} + T_{SI-UTRA}$

Where:

 $T_{evaluateUTRA\text{-}FDD} \qquad \quad See \; Table \; 4.2.2.5.1\text{-}1$

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

This gives a total of 20.48 s for lower priority cell reselection, allow 21 s.

A.4.3.1.3 EUTRA FDD-UTRA FDD cell reselection in fading propagation conditions: UTRA FDD is of lower priority

A.4.3.1.3.1 Test Purpose and Environment

This test is to verify the requirement for the EUTRA FDD- UTRA FDD inter-RAT cell reselection requirements specified in clause 4.2.2.5.1 when the UTRA cell is of lower priority, and to verify the robustness of the UE measurement filtering in a fading environment. The E-UTRA cell is in fading propagation conditions and the UTRA cell is in AWGN propagation conditions.

The test scenario comprises of one UTRA FDD and one E-UTRA FDD cells as given in tables A.4.3.1.3.1-1, A.4.3.1.3.1-2 and A.4.3.1.3.1-3. The test consists of four successive time periods, with time duration of T1 T2, T3 and

T4 respectively. Both E-UTRA cell 1 and UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1.

Table A.4.3.1.3.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T3 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
condition	Neighbour cell		Cell1	
E-UTRA P	RACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA A	Access Barring	-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1
T2		S	64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
Т3		S	<25	T3 need to be defined so that cell re-selection reaction time is taken into account. T3 is terminated when the UE starts to send preambles to cell 2
T4	T4		64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2

Table A.4.3.1.3.1-2: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit			Cell 1	
		T1	T2	T3	T4
E-UTRA RF Channel number				1	
BW _{channel}	MHz			10	
Correlation Matrix and Antenna			1	x2 Low	
Configuration					
OCNG Patterns defined in					
A.3.2.1.2 (OP.2 FDD)			OI	P.2 FDD	
PSS_RA	dB			0	
SSS_RA	dB			0	
PCFICH_RB	dB			0	
PHICH_RA	dB			0	
PHICH_RB	dB			0	
PDCCH_RA	dB			0	
PDCCH_RB	dB			0	
PDSCH_RA	dB	0			
PDSCH_RB	dB			0	
OCNG_RA ^{Note 1}	dB			0	
OCNG_RB ^{Note 1}	dB	0			
Qqualmin for UTRA neighbour	dB	-20			
cell	uБ			-20	
Qrxlevmin for UTRA neighbour	dBm			-115	
cell					
Qrxlevmin	dBm			-140	
N_{oc}	dBm/15			-104	
	kHz				
RSRP	dBm/15	-82	-82	-107	-107
	KHz				
\hat{E}_{s}/I_{ot}	dB	22	22	-3	-3
	40	20	20	-3	-3
\hat{E}_s/N_{oc}	dB	22	22	-3	-3
Treselection _{EUTRAN}	S	0			
Snonintrasearch	dB	Not sent			
Thresh _{serving, low}	dB	44			
Thresh _{x, low} (Note 2)	dB			42	
Propagation Condition				ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. This refers to the value of Thresh_{x, low} which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Note 2:

Table A.4.3.1.3.1-3: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2 (UTRA)				
		T1	T2	T3	T4	
UTRA RF Channel Number			Cha	annel 2		
CPICH_Ec/lor	dB			-10		
PCCPCH_Ec/lor	dB			-12		
SCH_Ec/lor	dB			-12		
PICH_Ec/lor	dB			-15		
OCNS_Ec/lor	dB		-(0.941		
\hat{I}_{or}/I_{oc}	dB	13	13	13	13	
I_{oc}	dBm/3,84 MHz			-70		
CPICH_Ec/lo	dB	-10.21	-10.21	-10.21	-10.21	
CPICH_RSCP	dBm	-67	-67	-67	-67	
Propagation Condition			Α	WGN		
Qqualmin	dB			-20		
Qrxlevmin	dBm			-115		
QrxlevminEUTRA	dBm	-140				
UE_TXPWR_MAX_RACH	dBm	21				
Treselection	S	0				
Sprioritysearch1	dB	42				
Sprioritysearch2	dB	0				
Thresh _{x, high} (Note 1)	dB			44		
Note 1: This refers to the value of Threshy bigh which is included in UTRA system						

Note 1: This refers to the value of Thresh_{x, high} which is included in UTRA system information, and is a threshold for the E-UTRA target cell

A.4.3.1.3.2 Test Requirements

The probability of reselection from cell 1to cell 2 during T2 observed during testing shall be less than 10%

The probability of reselection from cell 2 to cell 1 during T4 observed during testing shall be less than 10%

The cell reselection delay to lower priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2. In order to evaluate reselection delay, the system simulator first needs to verify that the UE is camped on cell 1 at the start of T3

The cell re-selection delay to lower priority shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA_FDD} + T_{SI-UTRA}$

Where:

 $T_{evaluateUTRA-FDD}$ See Table 4.2.2.5.1-1

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

This gives a total of 20.48 s for lower priority cell reselection, allow 21 s.

A.4.3.1.4 EUTRA FDD-UTRA FDD cell reselection: UTRA FDD is of lower priority for 5MHz bandwidth

A.4.3.1.4.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.4.3.1.2.1

The parameters of this test are the same as defined in Subclause A.4.3.1.2.1 except that the values of the parameters in the Table A.4.3.1.4.1-2 will replace the values of the corresponding parameters in A.4.3.1.2.1-2.

This is according to the principle defined in section A.3.7.2.

Table A.4.3.1.4.1-2: Cell specific test parameters for cell 1 (E-UTRA) for 5MHz bandwidth

Parameter	Unit	(Cell 1			
		T1	T2			
BW _{channel}	MHz	5				
OCNG Patterns defined in		OP	.16 FDD			
A.3.2.1.16 (OP.16 FDD)						
Note 1: See Table A.4.3.1.2.1-2 for the other parameters.						

A.4.3.1.4.2 Test Requirements

The test requirements defined in section A.4.3.1.2.1 shall apply to this test case.

A.4.3.1.5 Idle mode FDD to UTRA FDD interRAT reselection

A.4.3.1.5.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRA FDD-UTRA FDD inter-RAT cell reselection requirements for increased UE carrier monitoring specified in clause 4.2.2.4.

The test scenario comprises of indicating 8 UTRA FDD interfrequency cells on 6 different carriers in the neighbour list of cell 1 as given in table A.4.3.1.5-1 and cells 2 and 3 as given in table A.4.3.1.5-2. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3 and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (serving cell), and selects frequencies for cells 2 and 3 which are chosen from the 6 inter-RAT layers which are configured in the UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2 and 3 shall include the frequency of cell 1 in the normal performance group as well as the other frequencies configured to the UE in the test.

Cell 1, 2 and 3 are identified by the UE during time period T0. Cell 1, cell 2 and cell 3 all belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2 or 3. Cells 2 and 3 all have lower absolute priority than cell 1.

Table A.4.3.1.5-1: General test parameters for E-UTRAN FDD- UTRAN FDD inter frequency cell reselection test case

	meter	Unit	Value	Comment
Т0	Active cell		Cell 1	T0 is repeated on each repetition of the test. In T0 the test equipment selects frequencies for cell 2 and 3, and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition	Active cell		Cell 1	
T1 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T1
	Neighbour cell		Cell 1, cell 3	
T2 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T2
	Neighbour cell		Cell 2, cell 3	
T3 end condition	Active cell		Cell 3	UE shall perform reselection to cell 3 during T3
	Neighbour cell		Cell 1, cell 2	
T4 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T4
	Neighbour cell		Cell 2, cell 3	
UE configured E-UT Number			1	Serving cell and six UTRA FDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6 and 7 are indicated to have reduced performance
UE configured UTRA Number	RF Channel		2,3,4,5,6,7	
Test eqipment config	guration		Cell 1 uses E- UTRA RF channel number	
			1 Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7	
PRACH configuration	n		4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Infor	mation	-	Not Sent	No additional delays in random access procedure.
DRX cycle length		S	1.28	The value shall be used for all cells in the test.
ТО		S	(test equipment frequency selection and configuration time) + 960	Initialisation time need to be defined so that cell detection time is taken into account.
T1		S	25	T1 need to be defined so that cell reselection reaction time is taken into account.
T2		S	25	T2 need to be defined so that cell re- selection reaction time is taken into account
Т3		S	200	T3 need to be defined so that cell reselection reaction time is taken into account.
T4		s	25	T4 need to be defined so that cell re- selection reaction time is taken into account

Table A.4.3.1.5-2: Cell specific test parameters for E-UTRAN FDD- UTRAN FDD inter-RAT cell reselection test case in AWGN cell 1 (E-UTRAN)

Parameter	Unit	Cell 1				
		T0	T1	T2	T3	T4
E-UTRA RF Channel				1		
number						
BW _{channel}	MHz			lz: N _{RB} :		
				Hz: N _{RB}		
lo	dBm/4.	59.0	64.5	59.0	64.5	59.0
	5MHz(2	6	9	6	9	6
	5RB)					
	dBm/9	56.0	61.5	56.0	61.5	56.0
	Mhz	5	8	50.0	8	5
	(50RB)	3	0	3	0	3
PDSCH parameters:	(JOINE)		OP 16	FDD (5	<u> </u> 5MHz)	
DL Reference				FDD (10		
Measurement			·	(····· · - /	
Channel			OP.10	D TDD(5	MHz)	
				TDD (Ì(
Time offset with				0	•	
respect to cell1						
PBCH RA	dB			0		
PBCH RB	dB					
PSS RA	dB					
SSS RA	dB					
PCFICH RB	dB					
PHICH RA	dB					
PHICH RB	dB					
PDCCH RA	dB					
PDCCH RB	dB					
PDSCH RA	dB					
PDSCH RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
Qrxlevmin	dBm			-140		
N_{oc} Note 2	dBm			-98		
RSRP Note 3	dBm	-84	-90	-84	-90	-84
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	14	8	14	8	14
\hat{E}_s/N_{oc}	dB	14	8	14	8	14
Treselection _{EUTRAN}	S		-	0	-	
Snonintrasearch	dB			62		
Propagation				AWGN		
Condition						

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

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

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

Table A.4.3.1.5-3: Cell specific test parameters for cells 2 and 3 (UTRA)

Davometer	Unit	Cell 2						Cell 3			
Parameter	Unit	T0	T0 T1 T2 T3 T4				T0	T1	T2	T3	T4
UTRA RF Channel Number			that cell	mly selected from 1, 2, 3 such nat cell 2 is in the normal performance group Randomly selected from 4, 5, 6 s that cell 3 is in the reduced performance group							
CPICH_Ec/lor	dB		•	-10					-10	•	
PCCPCH_Ec/lor	dB			-12					-12		
SCH_Ec/lor	dB			-12					-12		
PICH_Ec/lor	dB			-15					-15		
OCNS_Ec/lor	dB			-0.941					0.941		
\hat{I}_{or}/I_{oc}	dB	-11	-5	-11	-11	-11	-11	-11	-11	-5	-11
I_{oc}	dBm/3,84 MHz	-70			-70						
CPICH_Ec/lo	dB	10.3 3	- 16.1 9	10.3 3	10.3 3	10.3 3	10.3 3	10.3 3	10.3 3	- 16.1 9	10.3 3
CPICH_RSCP	dBm	-69	-85	-69	-69	-69	-69	-69	-69	-85	-69
Propagation Condition			•	AWGN	•		AWGN				
Qqualmin	dB			-20					-20		
Qrxlevmin	dBm			-115					-115		
QrxlevminEUTRA	dBm	-140						-140			
UE_TXPWR_MAX_RACH	dBm	21						21			
Treselection	S	0						0			
Sprioritysearch1	dB	62				62					
Sprioritysearch2	dB	0					*				
Thresh _{serving, low}	dB			36					36		
Thresh _{x, low} (Note 1)	dB			50					50		

A.4.3.1.5.2 Test Requirements

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

The reselection delays shall meet the requirements in table A.4.3.1.5.2-1

Table A.4.3.1.5.2-1

Time phase	Target cell	Requirement for reselection delay (seconds)
T0	Cell 1	
T1	Cell 2 (normal performance group)	21
T2	Cell 1 (normal performance group)	8
T3	Cell 3 (reduced performance group)	148
T4	Cell 1 (normal performance group)	8

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $(N_{UTRA_carrier,normal}) * T_{evaluateUTRA_FDD} + T_{SI-UTRA}$ and to a reduced performance group cell can be expressed as: $6 * N_{UTRA_carrier,reduced} * T_{evaluateUTRA_FDD} + T_{SI-UTRA}$.

Where:

 $T_{evaluateUTRA-FDD}$ See Table 4.2.2.5.1-1

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

This gives a total of 20.48 s for normal performance group reselection, allow 21 s, and gives a total of 147.6 s for reduced performance group reselection, allow 148 s for reduced performance group in the test case. For reselections back to cell 1 since only one frequency is configured, the requirement is $T_{\text{evaluate,E-UTRAN_Inter}}$, $+ T_{\text{SI}} = 7.68$ s, allow 8s.

A.4.3.2 E-UTRAN FDD – UTRAN TDD:

A.4.3.2.1 Test Purpose and Environment

A.4.3.2.1.1 Void

A.4.3.2.1.2 1.28Mcps TDD option

This test is to verify the requirement for the E-UTRA FDD to UTRA TDD inter-RAT cell reselection requirements specified in clause 4.2.2.5.2 when the UTRA cell is of lower priority.

This test scenario comprised of 1 E-UTRA FDD serving cell (Cell 1), and 1 UTRA TDD cell (Cell 2) to be re-selected. Test parameters are given in table A.4.3.2.1.2-1, A.4.3.2.1.2-2, and A.4.3.2.1.2-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Cell 2 is of lower priority than cell 1.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS36.304.

Table A.4.3.2.1.2-1: General test parameters for E-UTRA FDD to UTRA (1.28 Mcps TDD OPTION) Cell Re-selection

Pai	Parameter		Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition			Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
condition	Neighbour cell		Cell1	E-UTRA FDD cell
CP length of	cell 1		normal	
E-UTRA PRA			4	As specified in table 5.7.1-2 in TS 36.211
Time offset b	etween cells		3 ms	Asynchronous cells
Access Barri	ng Information	-	Not sent	No additional delays in random access procedure.
Treselection		S	0	
DRX cycle le	ngth	S	1,28	
HCS			Not used	
T1		S	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		S	25	

Table A.4.3.2.1.2-2: Cell specific test parameters for cell re-selection E-UTRA FDD to UTRA TDD test case (cell 1)

Parameter	Unit	Ce	Cell 1			
		T1	T2			
E-UTRA RF Channel		,	1			
Number						
BW _{channel}	MHz	1	0			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0	0			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note1}	dB					
OCNG_RB ^{Note1}	dB					
Qrxlevmin	dBm/15kHz	-140	-140			
N_{oc}	dBm/15kHz	-6	98			
RSRP	dBm/15kHz	-87	-101			
\hat{E}_{s}/I_{ot}	dB	11	-3			
Snonintrasearch	dB	Not sent				
Thresh _{serving, low}	dB	46 (-9	4dBm)			
Thresh _{x, low} (Note2)	dB	24 (-79dBm)				
Propagation Condition		AW	'GN			
Note 1: OCNG shall be used such that cell is fully allocated and a						

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

Note2: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA TDD target cell

Table A.4.3.2.1.2-3: Cell specific test parameters for cell re-selection E-UTRA FDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)				
Timeslot Number		()	Dwl	PTS	
		T1	T2	T1	T2	
UTRA RF Channel			Char	nel 2		
Number (Note1)			Cilai	IIICI Z		
PCCPCH_Ec/lor	dB	-3	-3			
DwPCH_Ec/lor	dB			0	0	
OCNS_Ec/lor	dB	-3	-3			
\hat{I}_{or}/I_{oc}	dB	11	11	11	11	
I_{oc}	dBm/1.28 MHz	-80				
PCCPCH RSCP	dBm	-72	-72	n.a.	n.a.	
Propagation Condition		AWGN				
Qrxlevmin	dBm	-103				
Qoffset1 _{s,n}	dB	C1, C2: 0				
Qhyst1 _s	dB	0				
Thresh _{x, high} (Note2)	dB		46 (-9	4dBm)		

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note2: This refers to the value of Thresh_{x, high} which is included in UTRA system information, and is a threshold for the E-UTRA target cell

A.4.3.2.1.3 Void

A.4.3.2.2 Test Requirements

A.4.3.2.2.1 1.28Mcps TDD option

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA_TDD} + T_{SI-UTRA}$

Where:

 $T_{evaluateUTRA_TDD}$ 19.2s, See table table 4.2.2.5.2-1

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

This gives a total of 20.48 s, allow 21 s for lower priority cell reselection in the test case.

A.4.3.2.2.2.3 Void

A.4.3.2A E-UTRA FDD to UTRA TDD cell re-selection for IncMon

A.4.3.2A.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRA FDD to UTRA TDD inter-RAT cell reselection requirements for increased UE carrier monitoring specified in clause 4.2.2.4. UTRA TDD cells are of lower priority than E-UTRA serving cell.

The test scenario comprises of indicating 7 UTRA TDD inter-RAT cells on 7 different carriers in the neighbour list of cell 1 as given in tables A.4.3.2A.1-1, A.4.3.2A.1-2 and A.4.3.2A.1-3. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3, and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (E-UTRA serving cell), and selects frequencies for cells 2 and 3 which are chosen from the 7 inter-RAT layers which are configured in the UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2 and 3 shall include the frequency of cell 1 in the normal performance group as well as the other UTRA TDD frequencies configured to the UE in the test.

Cell 1, 2 and 3 are identified by the UE during time phase T0. Cell 1, cell 2 and cell 3 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2 or 3.

Table A.4.3.2A.1-1: General test parameters for E-UTRA FDD to UTRA TDD inter-RAT cell re-selection test case

Parameter		Unit	Value	Comment
ТО	Active cell		Cell1	T0 is repeated on each repetition of the test. In T0 the test equipment selects frequencies for cell 2, 3 and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition	Active cell		Cell 1	
T1 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T1
condition	Neighbour cell		Cell1	
T2 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T2
T3 end	Active cell		Cell3	UE shall perform reselection to cell 3 during T3
condition	Neighbour cell		Cell1	
T4 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 in T4 so that next repetition of test can start from T0
UE configuent Channel N	ured UTRA RF lumber		1, 2, 3, 4, 5, 6, 7	Seven UTRA TDD carrier frequencies are used in the UE neighbour cell list. Frequencies 4, 5, 6, and 7 are indicated to have reduced performance
	Test eqipment configuration		Cell 1, 2, 3	Cell 1 uses E-UTRA RF channel number 1 Cells 2 is randomly selected to use different frequencies selected from UTRA frequencies 1, 2, 3. Cells 3 is randomly selected to use different frequencies selected from UTRA frequencies 4, 5, 6, 7.
CP length	of cell 1		normal	
PRACH co	onfiguration		4	As specified in table 5.7.1-2 in TS 36.211 [16]
Access Ba Informatio		-	Not Sent	No additional delays in random access procedure.
T _{reselection}		S	0	
HCS			Not used	
DRX cycle	elength	S	1.28	The value shall be used for all cells in the test.
ТО	ТО		(Test equipment frequency selection and configuration time) + 960	T0 is defined so that the Test equipment selects frequencies and configures the cells, then the UE cell detection time is taken into account.
T1		S	60	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		S	25	T2 need to be defined so that cell re-selection reaction time is taken into account
T3		S	500	T3 need to be defined so that cell re-selection reaction time is taken into account.
T4		S	25	T4 need to be defined so that cell re-selection reaction time is taken into account

Table A.4.3.2A.1-2: E-UTRA Cell specific test parameters for E-UTRA FDD to UTRA TDD inter-RAT cell reselection test case in AWGN

Parameter	Unit	Cell 1					
		T0	T1	T2	T3	T4	
E-UTRA RF Channel number			1		•		
BW _{channel}	MHz		51	MHz: N _{RB} =	25		
				MHz: N _{RB} =			
OCNG Patterns				Hz: ОР.16 F ИНz: ОР.2 F			
PBCH_RA	dB						
PBCH_RB	dB	ĺ					
PSS_RA	dB	1					
SSS_RA	dB	ĺ					
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB			0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA NOTE 1	dB						
OCNG RB NOTE 1	dB						
$N_{oc}^{\text{NOTE 2}}$	dBm/15kHz		_	-98			
\hat{E}_s/N_{oc}	dB	11	-3	11	-3	11	
$\hat{E}_{\rm s}/I_{\rm ot}^{}$ NOTE 3	dB	11	-3	11	-3	11	
RSRP NOTE 3	dBm/15kHz	-87	-101	-87	-101	-87	
Q _{rxlevmin}	dBm/15kHz			-140	•		
S _{nonintrasearch}	dB			Not sent			
Thresh NOTE 4	dB			46 (-94dBm)		
TTITESTIX, IOW	dB	24 (-79dBm)					
Propagation Condition		AWGN					
Antenna Configuration				1x2			
Antenna Configuration							

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

NOTE 4: This refers to the value of Thresh_{x, low} which is included in E-UTRA system information, and is a threshold for the UTRA TDD target cell.

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

NOTE 3: E_s/I_{ot} and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.4.3.2A.1-3: UTRA TDD Cell specific test parameters for E-UTRA FDD to UTRA TDD inter-RAT cell reselection test case in AWGN

Parameter	Unit		Cell 2 (UTRA TDD)								
Timeslot Number		0 DwPTS									
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
UTRA RF Channel Number NOTE 1		Rando	mly sele	cted fron	n 1, 2, 3	such that	cell 2 is	in the no	rmal perf	ormance	group
PCCPCH_Ec/lor	dB			-3							
DwPCH_Ec/lor	dB								0		
OCNS_Ec/lor	dB			-3							
I_{oc}	dBm/ 1.28 MHz	-80									
\hat{I}_{or}/I_{oc}	dB	-3	11	-3	-3	-3	-3	11	-3	-3	-3
PCCPCH RSCP	dBm	-86	-72	-86	-86	-86			n.a.		
Propagation Condition						AW	'GN				
Q _{rxlevmin}	dBm					-1	03				
Qoffset1 _{s,n}	dB					C1, (C2: 0				
Qhyst1 _s	dB					()				
Sprioritysearch1	dB	24 (-79dBm)									
Sprioritysearch2	dB	0									
Thresh _{x, high} NOTE 2	dB	46 (-94dBm)									
Ssearch _{E-UTRA}	dB					Not	send				
Time offset to cell1	ms					;	3				

NOTE 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

NOTE 2: This refers to the value of Thresh_{x, high} which is included in UTRA system information, and is a threshold for the E-UTRA target cell

Table A.4.3.2A.1-4:

Parameter	Unit	Cell 3 (UTRA TDD)									
Timeslot Number		0						DwPTS			
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
UTRA RF Channel		Rand	lomly sel	ected fro	m 4, 5, 6	, 7 such	that cell:	3 is in the	e reduce	d perform	ance
Number NOTE 1						gro	oup				
PCCPCH_Ec/lor	dB			-3							
DwPCH_Ec/lor	dB								0		
OCNS_Ec/lor	dB			-3							
I_{oc}	dBm/ 1.28 MHz					-8	30				
\hat{I}_{or}/I_{oc}	dB	-3	-3	-3	11	-3	-3	-3	-3	11	-3
PCCPCH RSCP	dBm	-86	-86	-86	-72	-86			n.a.		
Propagation						۸۱۸	'GN				
Condition						7//	GIV				
Q _{rxlevmin}	dBm					-1	03				
Qoffset1 _{s,n}	dB					C1, (C2: 0				
Qhyst1 _s	dB					()				
Sprioritysearch1	dB					24 (-7	9dBm)				
Sprioritysearch2	dB	0									
Thresh _{x, high} NOTE 2	dB	46 (-94dBm)									
Ssearch _{E-UTRA}	dB	Not send									
Time offset to cell1	ms					;	3				
Time offset to cell2	μs			D. DE 3			3	,			

NOTE 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

NOTE 2: This refers to the value of Thresh_{x, high} which is included in UTRA system information, and is a threshold for the E-UTRA target cell

A.4.3.2A.2 Test Requirements

The cell reselection delay is defined as the time from the beginning of a relevant time period, to the moment when the UE camps on the target cell, and starts to send the SYNCH-UL sequence in the UpPTS on cell 2, 3 for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on the target cell.

The reselection delays shall meet the requirements in table A.4.3.2A.2-1

Table A.4.3.2A.2-1: Test requirements for E-UTRA FDD to UTRA TDD inter-RAT cell reselection

Time phase	Target cell	Requirement for reselection delay (seconds)
T1	Cell 2 (normal performance group)	58.9
T3	Cell 3 (reduced performance group)	462.1

The rate of correct cell reselections observed during repeated tests shall be at least 90%, with a successful reselection counted if it is within the required time regardless of the carrier frequencies involved. At least 90% of reselections to the reduced performance group shall be within the required time, and at least 90% of reselections to the normal performance group shall be within the required time.

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $N_{UTRA_carrier_TDD,normal} *T_{evaluateUTRA_TDD} + T_{SI_UTRA}$, and to a reduced performance group cell can be expressed as: $6 * N_{UTRA_carrier_TDD,reduced} *T_{evaluateUTRA_TDD} + T_{SI_UTRA}$,

Where:

T_{evaluateUTRA TDD} 19.2s, See Table 4.2.2.5.2-1

T_{SI_UTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 3 * 19.2 + 1.28 = 58.88 s for normal performance group reselection and 6 * 4 * 19.2 + 1.28 = 462.08s for reduced performance group reselection, allow 58.9s for normal performance group and 462.1s for reduced performance group in the test case.

Since only one E-UTRA frequency is configured and signal level of UTRA cell is lower than threshold of $S_{prioritysearch}$, the UE shall select back to cell 1 (E-UTRA cell) within $K_{carrier} * T_{evaluateEUTRA} + T_{SI} = 19.2 + 1.28 = 20.48s$.

A.4.3.3 E-UTRAN TDD – UTRAN FDD:

A.4.3.3.1 Test Purpose and Environment

This test is to verify the requirement for the EUTRA TDD- UTRA FDD inter-RAT cell reselection requirements specified in clause 4.2.2.5.1 when the UTRA cell is of lower priority.

The test scenario comprises of one UTRA FDD and one E-UTRA TDD cells as given in tables A.4.3.3.1-1, A.4.3.3.1-2 and A.4.3.3.1-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRA cell 1 and UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1.

Table A.4.3.3.1-1: General test parameters for EUTRA TDD- lower priority UTRA FDD inter RAT cell reselection test case

	Parameter	Unit	Value	Comment		
Initial condition	Active cell		Cell1	E-UTRAN cell		
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test		
	Neighbour cell		Cell2			
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2		
condition	ndition Neighbour cell		Cell1			
E-UTRA P	E-UTRA PRACH configuration		53	As specified in table 5.7.1-3 in TS 36.211		
Uplink-dow	vnlink configuration of		1	As specified in table 4.2.2 in TS 36.211		
Special sul cell 1	bframe configuration of		6	As specified in table 4.2.1 in TS 36.211		
E_UTRA A Information	access Barring	-	Not Sent	No additional delays in random access procedure.		
DRX cycle	DRX cycle length		1.28	The value shall be used for all cells in the test.		
T1	, ,		85	T1 need to be defined so that cell re-selection reaction time is taken into account.		
T2	T2				25	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.3.3.1-2: Cell specific test parameters for cell 1(E-UTRA)

Unit	Cell 1			
	T1	T2		
		1		
MHz		10		
	OI	P.2 TDD		
dB		0		
dB				
dВ		-20		
uВ		20		
dBm		-115		
		-140		
dBm/15 kHz		-98		
dBm/15 KHz	-86	-102		
dB	12	-4		
dB	12 -4			
S	0			
dB	Not sent			
dB	44			
dB	42			
		AWGN		
	MHz dB	MHz MHz Of dB dB dB dB dB dB dB dB dB d		

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

NOTE 2: This refers to the value of Thresh_{x, low} which is included in E-UTRA system information, and is a threshold for the UTRA target cell

Table A.4.3.3.1-3: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2 (UTRA)			
		T1	T2		
UTRA RF Channel Number		Char	nel 2		
CPICH_Ec/lor	dB		10		
PCCPCH_Ec/lor	dB		12		
SCH_Ec/lor	dB		12		
PICH_Ec/lor	dB		15		
OCNS_Ec/lor	dB	-0.9	941		
\hat{I}_{or}/I_{oc}	dB	13	13		
I_{oc}	dBm/3,84 MHz	-70			
CPICH_Ec/lo	dB	-10.21	-10.21		
CPICH_RSCP	dBm	-67	-67		
Propagation Condition		AW	/GN		
Qqualmin	dB	-2	20		
Qrxlevmin	dBm	-1	15		
QrxlevminEUTRA	dBm	-1	40		
UE_TXPWR_MAX_RACH	dBm	21			
Treselection	S	0			
Sprioritysearch1	dB	42			
Sprioritysearch2	dB	()		
Thresh _{x, high} (NOTE 1)	dB	4	8		
NOTE 1. This refers to the value of Threeh which is included					

NOTE 1: This refers to the value of Thresh_{x, high} which is included in UTRA system information, and is a threshold for the E-UTRA target cell

A.4.3.3.2 Test Requirements

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA_FDD} + T_{SI-UTRA}$

Where:

T_{evaluateUTRA-FDD} See Table 4.2.2.5.1-1

T_{SI-UTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for lower priority cell reselection, allow 21 s.

A.4.3.3A Idle mode TDD to UTRA FDD interRAT reselection

A.4.3.3A.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRA TDD-UTRA FDD inter-RAT cell reselection requirements for increased UE carrier monitoring specified in clause 4.2.2.4.

The test scenario comprises of indicating 8 UTRA FDD interfrequency cells on 6 different carriers in the neighbour list of cell 1 as given in table A.4.3.3A.1-2 and table A.4.3.3A.1-3 and cells 2 and 3 as given in table A.4.3.3A.1-4. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3 and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (serving cell), and selects frequencies for cells 2 and 3 which are chosen from the 6 inter-RAT layers which are configured in the

UE neighbour cell list as described in general and cell specific parameters. The neighbour lists of cells 2 and 3 shall include the frequency of cell 1 in the normal performance group as well as the other frequencies configured to the UE in the test.

Cell 1, 2 and 3 4 are identified by the UE during time period T0. Cell 1, cell 2 and cell 3 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2 or 3. Cells 1, 2 and 3 4 all have lower absolute priority than cell 1.

Table A.4.3.3A.1-1: General test parameters for E-UTRAN TDD- UTRAN FDD inter frequency cell reselection test case

Param	neter	Unit	Value	Comment
ТО	Active cell		Cell 1	To is repeated on each repetition of the test. In To the test equipment selects frequencies for cell 2, 3 and then time is allowed for the UE to identify the neighbour cells. See cell specific parameters for detailed settings.
T1 start condition	Active cell		Cell 1	
T1 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T1
	Neighbour cell		Cell 1, cell 3	
T2 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T2
	Neighbour cell		Cell 2, cell 3	
T3 end condition	Active cell		Cell 3	UE shall perform reselection to cell 3 during T3
	Neighbour cell		Cell 1, cell 2	
T4 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T4
LIC configure d C LICCA C	Neighbour cell		Cell 2, cell 3	Conting cell and six LTDA EDD as arise
UE configured E-UTRA F			1	Serving cell and six UTRA FDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6 and 7 are indicated to have reduced performance
UE configured UTRA RF			2,3,4,5,6,7	
Test eqipment configurati	ion		Cell 1 uses E- UTRA RF channel number 1	
			Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7	
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	on	-	Not Sent	No additional delays in random access procedure.
DRX cycle length		S	1.28	The value shall be used for all cells in the test.
ТО		S	(test equipment frequency selection and configuration time) + 960	Initialisation time need to be defined so that cell detection time is taken into account.
T1		S	25	T1 need to be defined so that cell reselection reaction time is taken into account.
T2		S	25	T2 need to be defined so that cell re- selection reaction time is taken into account
Т3		S	200	T3 need to be defined so that cell reselection reaction time is taken into account.
T4		S	25	T4 need to be defined so that cell re- selection reaction time is taken into account

Table A.4.3.3A.1-2: General test parameters for EUTRA TDD- UTRA FDD inter RAT cell re-selection test case

Parameter	Unit	Value	Comment
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211

Table A.4.3.3A.1-3: Cell specific test parameters for E-UTRAN TDD- UTRAN FDD inter-RAT cell reselection test case in AWGN cell 1 (E-UTRAN)

Parameter	Unit	Cell 1						
		T0	T1	T2	T3	T4		
E-UTRA RF Channel number				1				
BW _{channel}	MHz	5MHz: N _{RB} = 25						
		10MHz: N _{RB} = 50						
lo	dBm/4. 5MHz(2 5RB)	59.0 6	64.5 9	59.0 6	64.5 9	59.0 6		
	dBm/9 Mhz (50RB)	56.0 5	61.5 8	56.0 5	61.5 8	56.0 5		
PDSCH parameters:			OP.16	FDD (5MHz)			
DL Reference			OP.2	FDD (10	OMHz)			
Measurement								
Channel) TDD(5 TDD (10				
Time offset with				0	•			
respect to cell1	40							
PBCH RA	dB			0				
PBCH RB	dB							
PSS RA	dB							
SSS RA	dB							
PCFICH RB	dB							
PHICH RA	dB							
PHICH RB	dB							
PDCCH RA	dB							
PDCCH RB	dB							
PDSCH RA	dB							
PDSCH RB OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB dB							
				440				
Qrxlevmin	dBm			-140				
N _{oc} Note 2	dBm			-98				
RSRP Note 3	dBm	-84	-90	-90	-90	-84		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	14	8	8	8	14		
\hat{E}_s/N_{oc}	dB	14	8	8	8	14		
Treselection _{EUTRAN}	S			0				
Snonintrasearch	dB			62				
Propagation				AWGN				
Condition								
Note 1: OCNG shall						and		
achieved for Note 2: Interference in the test is	all OFDM s from other assumed to	itted power spectral density is						
for to be fu Note 3: RSRP levels information themselves.	lfilled. s have beer	n derived	d from o	ther par	ameters	s for		

Table A.4.3.3A.1-4: Cell specific test parameters for cells 2 and 3 (UTRA)

Davometer	Unit			Cell 2			Cell 3				
Parameter	Unit	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
UTRA RF Channel Number			that cell	ected fro 2 is in th rmance	e norma		Randomly selected from 4, 5, 6 such that cell 3 is in the reduced performance group				
CPICH_Ec/lor	dB		•	-10					-10	•	
PCCPCH_Ec/lor	dB			-12					-12		
SCH_Ec/lor	dB			-12					-12		
PICH_Ec/lor	dB			-15					-15		
OCNS_Ec/lor	dB			-0.941					0.941		
\hat{I}_{or}/I_{oc}	dB	-11	-5	-11	-11	-11	-11	-11	-11	-5	-11
I_{oc}	dBm/3,84 MHz			-70					-70		
CPICH_Ec/lo	dB	- 10.3 3	- 16.1 9	10.3 3	10.3 3	10.3 3	10.3 3	10.3 3	10.3 6	- 16.1 9	10.3 3
CPICH_RSCP	dBm	-69	-85	-69	-69	-69	-69	-69	-69	-85	-69
Propagation Condition			•	AWGN	•				AWGN		
Qqualmin	dB			-20					-20		
Qrxlevmin	dBm			-115					-115		
QrxlevminEUTRA	dBm			-140					-140		
UE_TXPWR_MAX_RACH	dBm			21					21		
Treselection	S	0					0				
Sprioritysearch1	dB	62						62			
Sprioritysearch2	dB	0					0				
Thresh _{serving, low}	dB			36 36							
Thresh _{x, low} (Note 1)	dB			50					50		

A.4.3.3A.2 Test Requirements

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

The reselection delays shall meet the requirements in table A.4.3.1.5-1

Table A.4.3.3A.2-1

Time phase	Target cell	Requirement for reselection delay (seconds)
T0	Cell 1	
T1	Cell 2 (normal performance group)	21
T2	Cell 1 (normal performance group)	8
T3	Cell 3 (reduced performance group)	148
T4	Cell 1 (normal performance group)	8

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $(N_{UTRA_carrier,normal}) * T_{evaluateUTRA_FDD} + T_{SI-UTRA}$ and to a reduced performance group cell can be expressed as: $6 * N_{UTRA_carrier,reduced} * T_{evaluateUTRA_FDD} + T_{SI-UTRA}$.

Where:

 $T_{evaluateUTRA-FDD}$ See Table 4.2.2.5.1-1

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

This gives a total of 20.48 s for normal performance group reselection, allow 21 s, and gives a total of 147.6 s for reduced performance group reselection, allow 148 s for reduced performance group in the test case. For reselections back to cell 1 since only one frequency is configured, the requirement is $T_{\text{evaluate,E-UTRAN_Inter}}$, + T_{SI} = 7.68s, allow 8s.

A.4.3.4 E-UTRAN TDD – UTRAN TDD:

A.4.3.4.1 E-UTRA to UTRA TDD cell re-selection: UTRA is of higher priority

A.4.3.4.1.1 Test Purpose and Environment

A.4.3.4.1.1.1 Void

A.4.3.4.1.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the E-UTRA TDD to UTRA TDD inter-RAT cell re-selection requirements specified in clause 4.2.2.5 when the UTRA cell is of higher priority.

This test scenario comprised of 1 E-UTRA TDD serving cell, and 1 UTRA TDD cell to be re-selected. Test parameters are given in table A.4.3.4.1.1.2-1, A.4.3.4.1.1.2-2, and A.4.3.4.1.1.2-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. E-UTRA cell 1 is already identified by the UE prior to the start of the test. Cell 2 is of higher priority than cell 1.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS36.304.

Table A.4.3.4.1.1.2-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Para	meter	Unit	Value	Comment
Initial	Active cell		Cell 1	UE is on cell 1 in the initialisation phase, so that reselection to
condition				cell 2 occurs during T2
T2 end	Active cell		Cell 2	UE shall perform reselection to cell 2 during T2
condition	Neighbour		Cell 1	
	cell			
T3 end	Active cell		Cell 1	UE shall perform reselection to cell 1 during T3
condition	Neighbour		Cell 2	
	cell			
Uplink-down			1	As specified in table 4.2.2 in TS 36.211
configuration				
Special subf			6	As specified in table 4.2.1 in TS 36.211
configuration				
PRACH con	figuration of		53	As specified in table 4.7.1-3 in TS 36.211
cell 1				
CP length of	cell 1		Normal	
Time offset I	between cells		3 ms	Asynchronous cells
Access Barr	ing	-	Not	No additional delays in random access procedure.
Information			sent	
T _{reselection}		S	0	
DRX cycle le	ength	S	1,28	
HCS			Not	
			used	
T1		S	>20	During T1, cell 2 shall be powered off, and during the off time
				the primary scrambling code shall be changed, The intention is
				to ensure that cell 2 has not been detected by the UE prior to
				the start of period T2.
T2		S	85	T2 needs to be defined so that cell re-selection reaction time is
				taken into account.
T3		S	25	T3 needs to be defined so that cell re-selection reaction time is
				taken into account.

Table A.4.3.4.1.1.2-2: Cell specific test parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit		Cell 1			
		T1	T2	T3		
E-UTRA RF Channel			1			
Number						
BW _{channel}	MHz		10			
PBCH_RA	dB]				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB]				
PHICH_RB	dB	0	0	0		
PDCCH_RA	dB]				
PDCCH_RB	dB]				
PDSCH_RA	dB]				
PDSCH_RB	dB]				
OCNG_RA ^{NOTE 1}	dB]				
OCNG_RB ^{NOTE 1}	dB					
Q _{rxlevmin}	dBm/15kHz	-140	-140	-140		
N_{oc}	dBm/15kHz		-98			
RSRP	dBm/15kHz	-87	-87	-87		
\hat{E}_{s}/I_{ot}	dB	11	11	11		
Thresh _{x, high} (NOTE 2)	dB	24(-79dBm)				
S _{nonintrasearch}	dB	46				
Propagation Condition			AWGN			

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

NOTE 2: This refers to the value of Thresh_x, high which is included in E-UTRA system information, and is a threshold for the UTRA target cell

Table A.4.3.4.1.1.2-3: Cell specific test parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number			0 DwPTS				;
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number (NOTE 1)				Chan	nel 2		
PCCPCH_Ec/lor	dB	-3	-3	-3			
DwPCH_Ec/Ior	dB				0	0	0
OCNS_Ec/lor	dB	-3	-3	-3			
\hat{I}_{or}/I_{oc}	dB	-inf	11	-3	-inf	11	-3
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-inf	-72	-86		n.a.	
Propagation Condition				AW	GN		
Q _{rxlevmin}	dBm			-1	03		
Qoffset1 _{s,n}	dB			C1, (C2: 0		
Qhyst1 _s	dB			()		
S _{nonintrasearch}	dB	Not sent					
Thresh _{serving, low}	dB	24 (-79dBm)					
Thresh _{x, low} (NOTE 2)	dB			46 (-9	4dBm)		

NOTE 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

NOTE 2: This refers to the value of Thresh_{x, low} which is included in UTRA system information, and is a threshold for the E-UTRA target cell

A.4.3.4.1.1.3 Void

A.4.3.4.1.2 Test Requirements

A.4.3.4.1.2.1 Void

A.4.3.4.1.2.2 1.28 Mpcs TDD option

The cell reselection delay to higher priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to higher priority shall be less than 81 s.

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher_priority_search} + T_{evaluateUTRA_TDD} + T_{SI_UTRA}$,

Where:

 $T_{higher_priority_search}$ 60s, See clause 4.2.2

T_{evaluateUTRA TDD} 19.2s, See Table 4.2.2.5.2-1

T_{SI UTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 80.48 s, allow 81 s for higher priority cell reselection in the test case.

A.4.3.4.1.2.3 Void

A.4.3.4.2 E-UTRA to UTRA TDD cell re-selection: UTRA is of lower priority

A.4.3.4.2.1 Test Purpose and Environment

A.4.3.4.2.1.1 Void

A.4.3.4.2.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the E-UTRA TDD to UTRA TDD inter-RAT cell re-selection requirements specified in clause 4.2.2.5 when the UTRA cell is of lower priority.

This test scenario comprised of 1 E-UTRA TDD serving cell (Cell 1), and 1 UTRA TDD cell (Cell 2) to be re-selected. Test parameters are given in table A.4.3.4.2.1.2-1, A.4.3.4.2.1.2-2, and A.4.3.4.2.1.2-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Cell 2 is of lower priority than cell 1.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS36.304.

Table A.4.3.4.2.1.2-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Paran	neter	Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN cell
T1 end	Active cell		Cell1	UE shall perform reselection to cell 1 during T1 for
condition				subsequent iterations of the test
	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
condition	Neighbour cell		Cell1	E-UTRA TDD cell
Uplink-downlink of cell 1	configuration of		1	As specified in table 4.2.2 in TS 36.211
Special subframe of cell 1	configuration		6	As specified in table 4.2.1 in TS 36.211
PRACH configura	ation of cell 1		53	As specified in table 4.7.1-3 in TS 36.211
CP length of cell	1		Normal	
Time offset between	een cells		3 ms	Asynchronous cells
Access Barring Ir	nformation	-	Not	No additional delays in random access procedure.
			sent	
Treselection		S	0	
DRX cycle length]	S	1,28	
HCS			Not	
			used	
T1		S	85	
T2		S	25	

Table A.4.3.4.2.1.2-2: Cell specific test parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

			II 1
		T1	T2
E-UTRA RF Channel		,	1
Number			
BW _{channel}	MHz	1	0
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB]	
PHICH_RB	dB	0	0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note1}	dB		
OCNG_RB ^{Note1}	dB		
Qrxlevmin	dBm/15kHz	-140	-140
N_{oc}	dBm/15kHz	-6	98
RSRP	dBm/15kHz	-87	-101
\hat{E}_s/I_{ot}	dB	11	-3
Snonintrasearch	dB	Not	sent
Thresh _{serving, low}	dB	46 (-9	4dBm)
Thresh _{x, low} (Note2)	dB	24 (-79dBm)	
Propagation Condition		AW	/GN
	e used such that cel		
	transmitted power s	pectral density	is achieved
for all OFDM s			
	the value of Thresh _x information, and is		

UTRA system information, and is a threshold for the UTRA

target cell

Table A.4.3.4.2.1.2-3: Cell specific test parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)				
Timeslot Number		0		Dwl	PTS	
		T1	T2	T1	T2	
UTRA RF Channel Number (Note1)			Char	nel 2		
PCCPCH_Ec/lor	dB	-3	-3			
DwPCH_Ec/lor	dB			0	0	
OCNS_Ec/lor	dB	-3	-3			
\hat{I}_{or}/I_{oc}	dB	11	11	11	11	
I_{oc}	dBm/1.28 MHz		-8	30		
PCCPCH RSCP	dBm	-72	-72	n.a.	n.a.	
Propagation Condition			AW	'GN		
Qrxlevmin	dBm	-103				
Qoffset1 _{s,n}	dB	C1, C2: 0				
Qhyst1 _s	dB	0				
Thresh _{x, high} (Note2)	dB		46 (-9	4dBm)		

Note1: In the case of multi-frequency cell, the UTRA RF Channel

Number is the primary frequency's channel number.

Note2: This refers to the value of $\mathsf{Thresh}_{\mathsf{x},\,\mathsf{high}}$ which is included in

UTRA system information, and is a threshold for the E-

UTRA target cell

A.4.3.4.2.1.3 Void

A.4.3.4.2.2 Test Requirements

A.4.3.4.2.2.1 Void

A.4.3.4.2.2.2 1.28 Mpcs TDD option

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA_TDD} + T_{SI_UTRA}$,

Where:

T_{evaluateUTRA_TDD} 19.2s, See Table 4.2.2.5.2-1

 T_{SI_UTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s, allow 21 s for lower priority cell reselection in the test case.

A.4.3.4.2.2.3 Void

A.4.3.4.3 EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority

A.4.3.4.3.1 Test Purpose and Environment

This test is to verify the requirement for the EUTRA TDD- UTRA TDD inter-RAT cell reselection requirements specified in clause 4.2.2.5.2 when the UTRA cell is of lower priority, and to verify the robustness of the UE measurement filtering in a fading environment. The E-UTRA cell is in fading propagation conditions and the UTRA cell is in AWGN propagation conditions.

The test scenario comprises of one UTRA TDD and one E-UTRA TDD cells as given in tables A.4.3.4.3.1-1, A.4.3.4.3.1-2 and A.4.3.4.3.1-3. The test consists of four successive time periods, with time duration of T1 T2, T3 and T4 respectively. Both E-UTRA cell 1 and UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1.

Table A.4.3.4.3.1-1: General test parameters for EUTRA TDD- lower priority UTRA TDD inter RAT cell re-selection test case

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T3 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
condition	Neighbour cell		Cell1	
E-UTRA P	RACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Uplink-dov cell 1	vnlink configuration of		1	As specified in table 4.2.2 in TS 36.211
Special su cell 1	cial subframe configuration of 1		6	As specified in table 4.2.1 in TS 36.211
E_UTRA A	ccess Barring	-	Not Sent	No additional delays in random access
Information	า			procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1
T2		S	64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
ТЗ		S	<25	T3 need to be defined so that cell re-selection reaction time is taken into account. T3 is terminated when the UE starts to send PRACH preambles to cell 2
T4		S	64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2

Table A.4.3.4.3.1-2: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit		Ce	II 1		
		T1	T2	Т3	T4	
E-UTRA RF Channel			•	1		
number						
BW _{channel}	MHz		1	0		
Correlation Matrix and			1x2	Low		
Antenna Configuration						
OCNG Patterns defined in			OP.2	TDD		
A.3.2.2.2 (OP.2 TDD)						
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB		()		
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
Qrxlevmin for UTRA	dBm		-1	03		
neighbour cell						
Qrxlevmin	dBm		-1	40		
N_{oc}	dBm/15 kHz		-1	04		
RSRP	dBm/15 KHz	-82	-82	-107	-107	
\hat{E}_{s}/I_{ot}	dB	22	22	-3	-3	
\hat{E}_s/N_{oc}	dB	22 22 -3 -3			-3	
Treselection _{EUTRAN}	S	0				
Snonintrasearch	dB		Not	sent		
Thresh, low (Note 2)	dB		4	4		
Thresh _{x, low} (Note 2)	dB	24				
Propagation Condition			ETI	J70		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total

transmitted power spectral density is achieved for all OFDM symbols. This refers to the value of Thresh_{x, low} which is included in E-UTRA system information, and is a threshold for the UTRA target cell. Note 2:

AWGN

-103

-140

21

0

44

 I_{or}/I_{oc}

Qrxlevmin

Qrxlevmin_{EUTRA}

Treselection

Thresh_{x, high}

UE_TXPWR_MAX_RACH

(Note2)

 I_{oc}

Unit **Parameter** Cell 2 (UTRA) **DwPTS** Timeslot Number 0 T1 T2 T3 T4 T1 T2 T3 T4 UTRA RF Channel Number (Note1 Channel 2 PCCPCH_Ec/lor dB -3 DwPCH_Ec/lor dB 0 OCNS_Ec/lor dΒ dB 13 13 13 13 13 13 13 13 dBm/1.28 MHz -80 PCCPCH RSCP dBm -70 -70 -70 -70 | n.a. | n.a. | n.a. | n.a. Propagation Condition

Table A.4.3.4.3.1-3: Cell specific test parameters for cell 2 (UTRA)

In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's Note1:

dBm

dBm

dBm

s

dB

channel number.

Note2: This refers to the value of Thresh_{x, high} which is included in UTRA system information, and is a

threshold for the E-UTRA target cell

A.4.3.4.3.2 **Test Requirements**

The probability of reselection from cell 1 to cell 2 during T2 observed during testing shall be less than 10%

The probability of reselection from cell 2 to cell 1 during T4 observed during testing shall be less than 10%

The cell reselection delay to lower priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequene in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2. In order to evaluate reselection delay, the system simulator first needs to verify that the UE is camped on cell 1 at the start of T3

The cell re-selection delay to lower priority shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: TevaluateUTRA TDD + TSI-UTRA

Where:

19.2s, See Table 4.2.2.5.2-1 $T_{evaluateUTRA_TDD}$

Maximum repetition period of relevant system info blocks that needs to be received by the UE $T_{SI-UTRA}$

to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for lower priority cell reselection, allow 21 s.

E-UTRA TDD to UTRA TDD cell re-selection for IncMon A.4.3.4.4

A.4.3.4.4.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRA TDD to UTRA TDD inter-RAT cell reselection requirements for increased UE carrier monitoring specified in clause 4.2.2.4. UTRA TDD cells are of lower priority than E-UTRA serving cell.

The test scenario comprises of indicating 7 UTRA TDD inter-RAT cells on 7 different carriers in the neighbour list of cell 1 as given in tables A.4.3.4.4.1-1, A.4.3.4.4.1-2 and A.4.3.4.4.1-3. Each repetition of the test consists of five successive time periods, with time duration of T0, T1, T2, T3, and T4 respectively. In the initialisation phase and at the start of each repetition of T0, the test equipment provides signals for cell 1 (E-UTRA serving cell), and selects frequencies for cells 2 and 3 which are chosen from the 7 inter-RAT layers which are configured in the UE neighbour

cell list as described in general and cell specific parameters. The neighbour lists of cells 2 and 3 shall include the frequency of cell 1 in the normal performance group as well as the other UTRA TDD frequencies configured to the UE in the test.

Cell 1, 2, and 3 are identified by the UE during time phase T0. Cell 1, cell 2, and cell 3 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2 or 3.

Table A.4.3.4.4.1-1: General test parameters for E-UTRA TDD to UTRA TDD inter-RAT cell re-selection test case

Parameter		Unit Value		Comment					
ТО			Cell1	To is repeated on each repetition of the test. In To the test equipment selects frequencies for cell 2, 3 and the time is allowed for the UE to identify the neighbour of See cell specific parameters for detailed settings.					
T1 start condition	Active cell		Cell 1						
T1 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T1					
condition	Neighbour cell		Cell1						
T2 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T2					
T3 end	Active cell		Cell3	UE shall perform reselection to cell 3 during T3					
condition	Neighbour cell		Cell1]					
T4 end condition			Cell1	UE shall perform reselection to cell 1 in T4 so that next repetition of test can start from T0					
UE configured UTRA RF Channel Number				Seven UTRA TDD carrier frequencies are used in the UE neighbour cell list. Frequencies 4, 5, 6, and 7 are indicated to have reduced performance					
Test eqipment configuration		Cell 1, 2, 3		Cell 1 uses E-UTRA RF channel number 1 Cells 2 is randomly selected to use different frequencies selected from UTRA frequencies 1, 2, 3. Cells 3 is randomly selected to use different frequencies selected from UTRA frequencies 4, 5, 6, 7.					
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [16]					
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [16]					
CP length of cell 1			normal						
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211 [16]					
Access Barring Information		-	Not Sent	No additional delays in random access procedure.					
Treselection		S	0						
HCS			Not used						
DRX cycle	DRX cycle length		1.28	The value shall be used for all cells in the test.					
ТО		S	(Test equipment frequency selection and configuration time) + 960	To is defined so that the Test equipment selects frequencies and configures the cells, then the UE cell detection time is taken into account.					
T1		S	60	T1 need to be defined so that cell re-selection reaction time is taken into account.					
T2		S	25	T2 need to be defined so that cell re-selection reaction time is taken into account					
ТЗ		S	500	T3 need to be defined so that cell re-selection reaction time is taken into account.					
T4		S	25	T4 need to be defined so that cell re-selection reaction time is taken into account					

Table A.4.3.4.4.1-2: E-UTRA Cell specific test parameters for E-UTRA TDD to UTRA TDD inter-RAT cell reselection test case in AWGN

Parameter	Unit	Cell 1								
		T0	T1	T2	Т3	T4				
E-UTRA RF Channel number		1								
BW _{channel}	MHz	5MHz: N _{RB} = 25								
		10MHz: N _{RB} = 50								
OCNG Patterns		5MHz: OP.10 TDD								
			10N	1Hz: OP.2	TDD					
PBCH_RA	dB									
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB	1								
PHICH_RA	dB	1								
PHICH_RB	dB	0								
PDCCH_RA	dB	1								
PDCCH_RB	dB									
PDSCH_RA	dB	1								
PDSCH_RB	dB	1								
OCNG_RA Note 1	dB	7								
OCNG_RB Note 1	dB									
$N_{oc}^{\overline{\text{Note 2}}}$	dBm/15kHz	-98								
\hat{E}_s/N_{oc}	dB	11	-3	11	-3	11				
\hat{E}_{s}/I_{ot} Note 3	dB	11	-3	11	-3	11				
RSRP Note 3	dBm/15kHz	-87	-101	-87	-101	-87				
Q _{rxlevmin}	dBm/15kHz	-140								
S _{nonintrasearch}	dB	Not sent								
Thresh _{serving, low}	dB	46 (-94dBm)								
Thresh _{x, low} Note 4	dB		2	1)						
Propagation Condition		AWGN								
Antenna Configuration				1x2						
Note 1: OCNG shall be used s	uch that both cells are	fully alloca	ated and a	constant to	tal transmit	ted powe				

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

E_s/I_{ot} and RSRP levels have been derived from other parameters for information purposes. They Note 3: are not settable parameters themselves.

Note 4: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA TDD target cell.

Table A.4.3.4.4.1-3: UTRA TDD Cell specific test parameters for E-UTRA TDD to UTRA TDD inter-RAT cell reselection test case in AWGN

Parameter	Unit	Cell 2 (UTRA TDD)											
Timeslot Number		0						DwPTS					
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4		
UTRA RF Channel Number Note1		Randomly selected from 1, 2, 3 such that cell 2 is in the normal performance group									group		
PCCPCH_Ec/lor	dB	-3											
DwPCH_Ec/lor	dB							0					
OCNS_Ec/lor	dB	-3											
I_{oc}	dBm/ 1.28 MHz	-80											
\hat{I}_{or}/I_{oc}	dB	-3	11	-3	-3	-3	-3	11	-3	-3	-3		
PCCPCH RSCP	dBm	-86	-72	-86	-86	-86	n.a.						
Propagation Condition		AWGN											
Q _{rxlevmin}	dBm	-103											
Qoffset1 _{s,n}	dB	C1, C2: 0											
Qhyst1 _s	dB	0											
Sprioritysearch1	dB	24 (-79dBm)											
Sprioritysearch2	dB						0						
Thresh _{x, low} Note2	dB					46 (-9	94dBm)						
Ssearch _{E-UTRA}	dB	Not send											
Time offset to cell1	ms	3											
	of multi-frequ								juency's (channel n	umber.		

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note2: This refers to the value of Thresh_{x, low} which is included in UTRA system information, and is a threshold for the E-UTRA target cell

Table A.4.3.4.4.1-4:

Parameter	Unit	Cell 3 (UTRA TDD)											
Timeslot Number		0						DwPTS					
		T0	T1	T2	T3	T4	T0	T1	T2	T3	T4		
UTRA RF Channel Number Note1		Randomly selected from 4, 5, 6, 7 such that cell 3 is in the reduced performance group											
PCCPCH_Ec/lor	dB		-3										
DwPCH_Ec/lor	dB	0											
OCNS_Ec/lor	dB	-3											
I_{oc}	dBm/ 1.28 MHz	-80											
\hat{I}_{or}/I_{oc}	dB	-3	-3	-3	11	-3	-3	-3	-3	11	-3		
PCCPCH RSCP	dBm	-86	-86	-86	-72	-86		n.a.					
Propagation Condition		AWGN											
Q _{rxlevmin}	dBm					-1	03						
Qoffset1 _{s,n}	dB	C1, C2: 0											
Qhyst1 _s	dB	0											
Sprioritysearch1	dB	24 (-79dBm)											
Sprioritysearch2	dB	0											
Thresh _{x, high} Note2	dB					46 (-9	4dBm)						
Ssearch _{E-UTRA}	dB					Not	send						
Time offset to cell1	ms	3											
Time offset to cell2	μs	3											
	of multi-frequ												

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note2: This refers to the value of Thresh_{x, high} which is included in UTRA system information, and is a threshold for the E-UTRA target cell

A.4.3.4.4.2 Test Requirements

The cell reselection delay is defined as the time from the beginning of a relevant time period, to the moment when the UE camps on the target cell, and starts to send the SYNCH-UL sequence in the UpPTS on cell 2, 3 for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on the target cell.

The reselection delays shall meet the requirements in table A.4.3.4.4.2-1

Table A.4.3.4.4.2-1: Test requirements for E-UTRA TDD to UTRA TDD inter-RAT cell reselection

Time phase	Target cell	Requirement for reselection delay (seconds)
T1	Cell 2 (normal performance group)	58.9
T3	Cell 3 (reduced performance group)	462.1

The rate of correct cell reselections observed during repeated tests shall be at least 90%, with a successful reselection counted if it is within the required time regardless of the carrier frequencies involved. At least 90% of reselections to the reduced performance group shall be within the required time, and at least 90% of reselections to the normal performance group shall be within the required time.

NOTE: The cell re-selection delay to a normal performance group cell can be expressed as: $N_{UTRA_carrier_TDD,normal} *T_{evaluateUTRA_TDD} + T_{SI_UTRA}$, and to a reduced performance group cell can be expressed as: $6 * N_{UTRA_carrier_TDD,reduced} *T_{evaluateUTRA_TDD} + T_{SI_UTRA}$,

Where:

T_{evaluateUTRA TDD} 19.2s, See Table 4.2.2.5.2-1

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

* 19.2 + 1.28 = 58.88 s for normal performance group reselection and 6 * 4 * 19.2

This gives a total of 3*19.2 + 1.28 = 58.88 s for normal performance group reselection and 6*4*19.2 + 1.28 = 462.08s for reduced performance group reselection, allow 58.9s for normal performance group and 462.1s for reduced performance group in the test case.

Since only one E-UTRA frequency is configured and signal level of UTRA cell is lower than threshold of $S_{prioritysearch}$, the UE shall select back to cell 1 (E-UTRA cell) within $K_{carrier} * T_{evaluateEUTRA} + T_{SI} = 19.2 + 1.28 = 20.48s$.

A.4.4 E-UTRAN to GSM Cell Re-Selection

A.4.4.1 E-UTRAN FDD – GSM:

A.4.4.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to GSM cell re-selection delay reported in clause 4.2.2.5.

This scenario implies the presence of 1 E-UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 E-UTRA carrier and 12 GSM cells. Test parameters are given in Table, A.4.4.1-1, A.4.4.1-2, A.4.4.1-3. E-UTRA FDD cell (Cell 1) and GSM cell (cell 2) shall belong to different Location Areas. The test comprises two successive time periods, T1 and T2. During initialization before the start of the test, the UE is camped on cell 1. By the end of T1, the UE has identified BSIC on the GSM BCCH carrier of cell 2 but the signal levels do not meet the reselection criterion during T1. At the start of T2, the signal levels change such that cell 2 satisfies reselection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA FDD layer.

Table A.4.4.1-1: General test parameters for E-UTRA FDD GSM cell re-selection test case

	Parameter	Unit	Value	Comment
Initial	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation
condition				phase and shall be able to detect and monitor
				the 4 strongest GSM BCCH carriers in T1 . Cell
				1 is an E-UTRA FDD cell.
Final	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2.
condition				Cell 2 is a GSM cell.
E-UTRA R	F Channel Number		1	1 E-UTRA FDD carrier frequency
GSM ARF	CN		1	12 GSM BCCH carriers are used
PRACH co	nfiguration		4	As specified in table 5.7.1-2 in TS 36.211
Access Ba	rring Information	-	Not Sent	No additional delays in random access
				procedure.
CP length	of cell 1		Normal	
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	35	T1 need to be defined so that cell re-selection
				reaction time is taken into account.
T2		S	35	T2 need to be defined so that the higher layer
				search periodicity and cell re-selection reaction
				time are taken into account.
Propagatio	n channel		AWGN	

Table A.4.4.1-2: Cell-specific test parameters for Cell 1 – E-UTRA FDD cell

Parameter	Unit		Cell 1
		T1	T2
E-UTRA RF Channel			1
number			
BW _{channel}	MHz		10
OCNG Patterns defined in			
A.3.2.1.2 (OP.2 FDD)		OF	P.2 FDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		_
PHICH_RB	dB		0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
Qrxlevmin	dBm		-140
N_{oc}	dBm/15 kHz		-98
RSRP	dBm/15 KHz	-89	-102
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	9	-4
\hat{E}_s/N_{oc}	dB	9	-4
TreselectionEUTRAN	S		0
S _{nonintrasearch}	dB	Not sent	
Thresh _{serving, low}	dB	44	
Thresh _{x, low} (Note 2)	dB	24	

Note 2: This refers to Thresh_{x, low} which is included in E-UTRA system information, and is a threshold for GSM target cell.

Table A.4.4.1-3: Cell-specific test parameters for Cell 2 - GSM cell

Parameter	Unit	Cell 2 (GSM)		
Parameter	Onic	T1	T2	
Absolute RF Channel Number		ARFO	CN 1	
RXLEV	dBm	-90	-75	
RXLEV_ACCESS_MIN	dBm	-1()5	
MS_TXPWR_MAX_CCH	dBm	24	4	

A.4.4.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than $26 \text{ s} + T_{BCCH}$, where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [8].

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

NOTE: The cell re-selection delay can be expressed as: $4*T_{measureGSM} + T_{BCCH}$, where:

 $T_{measureGSM}$ See Table 4.2.2.5.3-1 in clause 4.2.2.5.3.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [8].

According to [8], the maximum time allowed to read the BCCH data, when being synchronized to

a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s + T_{BCCH} , allow 26 s + T_{BCCH} in the test case.

A.4.4.2 E-UTRAN TDD – GSM:

A.4.4.2.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD to GSM cell re-selection delay reported in clause 4.2.2.5.

This scenario implies the presence of 1 E-UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 E-UTRA carrier and 12 GSM cells. Test parameters are given in Table, A.4.4.2-1, A.4.4.2-2, A.4.4.2-3. E-UTRA TDD cell (Cell 1) and GSM cell (cell 2) shall belong to different Location Areas. The test comprises two successive time periods, T1 and T2. During initialization before the start of the test, the UE is camped on cell 1. By the end of T1, the UE has identified BSIC on the GSM BCCH carrier of cell 2 but the signal levels do not meet the reselection criterion during T1. At the start of T2, the signal levels change such that cell 2 satisfies reselection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA TDD layer.

Table A.4.4.2-1: General test parameters for E-UTRA TDD GSM cell re-selection test case

	Parameter	Unit	Value	Comment
Initial	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation
condition				phase and shall be able to detect and monitor
				the 4 strongest GSM BCCH carriers in T1. Cell 1
				is an E-UTRA TDD cell.
Final	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2.
condition				Cell 2 is a GSM cell.
E-UTRA R	F Channel Number		1	1 E-UTRA TDD carrier frequency
GSM ARFO	CN		1	12 GSM BCCH carriers are used
Uplink-dow	nlink configuration of		1	As specified in table 4.2.2 in TS 36.211
cell 1	-			
Special sub	oframe configuration		6	As specified in table 4.2.1 in TS 36.211
for cell 1	-			
PRACH co	nfiguration for cell 1		53	As specified in table 5.7.1-3 in TS 36.211
CP length	of cell 1		Normal	
Access Ba	rring Information	-	Not Sent	No additional delays in random access
				procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	35	T1 need to be defined so that cell re-selection
				reaction time is taken into account.
T2		S	35	T2 need to be defined so that the higher layer
				search periodicity and cell re-selection reaction
				time are taken into account.
Propagatio	n channel		AWGN	

Table A.4.4.2-2: Cell-specific test parameters for Cell 1 – E-UTRA TDD cell

Parameter	Unit		Cell 1
		T1	T2
E-UTRA RF Channel			1
number			
BW _{channel}	MHz		10
OCNG Patterns defined in			
A.3.2.2.2 (OP.2 TDD)		OI	P.2 TDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
Qrxlevmin	dBm		-140
N_{oc}	dBm/15 kHz		-98
RSRP	dBm/15 KHz	-89	-102
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	9	-4
\hat{E}_s/N_{oc}	dB	9	-4
TreselectionEUTRAN	S		0
Snonintrasearch	dB	N	lot sent
Thresh _{serving, low}	dB	44	
Thresh _{x, low} (Note 2)	dB		24

for all OFDM symbols.

Note 2: This refers to Thresh_{x, low} which is included in E-UTRA system information, and is a threshold for GSM target cell.

Table A.4.4.2-3: Cell-specific test parameters for Cell 2 - GSM cell

Parameter	Unit	Cell 2 (GSM)	
Parameter	Offic	T1	T2
Absolute RF Channel Number		ARFCN 1	I
RXLEV	dBm	-90	-75
RXLEV_ACCESS_MIN	dBm	-105	
MS_TXPWR_MAX_CCH	dBm	24	

A.4.4.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than $26 \text{ s} + T_{BCCH}$, where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [8].

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

NOTE: The cell re-selection delay can be expressed as: $4*T_{measureGSM} + T_{BCCH}$, where:

 $T_{measureGSM}$ See Table 4.2.2.5.3-1 in clause 4.2.2.5.3.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [8].

According to [8], the maximum time allowed to read the BCCH data, when being synchronized to

a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s + T_{BCCH} , allow 26 s + T_{BCCH} in the test case.

A.4.5 E-UTRAN to HRPD Cell Re-Selection

A.4.5.1 E-UTRAN FDD – HRPD

A.4.5.1.1 E-UTRAN FDD – HRPD Cell Reselection: HRPD is of Lower Priority

A.4.5.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD- HRPD inter-RAT cell reselection requirements specified in clause 4.2.2.5.4 when the HRPD cell is of lower priority.

The test scenario comprises of one HRPD and one E-UTRAN FDD cells as given in tables A.4.5.1.1.1-1, A.4.5.1.1.1-2 and A.4.5.1.1.1-3.

The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRAN FDD cell 1 and HRPD cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell 2 is of lower priority than cell 1. Cell 1 and cell 2 shall belong to different tracking areas.

Table A.4.5.1.1.1-1: General Test Parameters for E-UTRAN FDD - lower priority HRPD Cell Reselection

	Parameter			Comment
Initial condition	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbour cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell is selecting during T2
DRX cycle length		S	1.28	
E-UTRA FDD RF (E-UTRA FDD RF Channel Number		1	Only one FDD carrier frequency is used.
E-UTRA FDD Cha	nnel Bandwidth (BW _{channel})	MHz	10	
HRPD RF Channe	l Number		1	Only one HRPD carrier
				frequency is used.
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random
				access procedure.
T1		S	30	
T2		s	30	

Table A.4.5.1.1.1-2: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter Unit Cell 1		l 1	
		T1	T2
E-UTRA RF Channel number		1	
BW _{channel}	MHz	1(0
OCNG Patterns defined in A.3.2.1.2			
(OP.2 FDD)		OP.2	FDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
N_{oc}	dBm/15 kHz	-9	8
RSRP	dBm/15 KHz	-89	-102
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	9	-4
\hat{E}_s/N_{oc}	dB	9	-4
Treselection _{EUTRAN}	S	C	
Snonintrasearch	dB	Not s	sent
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-14	10
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
SservingCell	dB	51	38
Thresh _{serving, low}	dB	44	4
Propagation Condition		AW	GN

Parameter Unit Cell 2 <u>T1</u> **T2** HRPD RF Channel Number Control E_b (38.4 kbps) dB 21 Control E_b (76.8 kbps) dB 18 N, \hat{I}_{or}/I_{oc} dB 0 0 dBm/ 1.2288 -55 MHz CDMA2000 HRPD Pilot Strength dΒ -3 -3 **Propagation Condition AWGN** SnonServingCell,x -6 Treselection 0 s hrpd-CellReselectionPriority 0 Thresh_{x, low} -14

Table A.4.5.1.1.1-3: Cell Specific Test Parameters for HRPD (cell # 2)

A.4.5.1.1.2 Test Requirements

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: T_{evaluateHRPD} + T_{SI-HRPD}

Where:

T_{evaluatHRPD} See Table 4.2.2.5.4-1

T_{SI-HRPD} Maximum repetition period of relevant system information blocks that need to be received by

the UE to camp on cell 2; 1704 ms is assumed in this test case.

This gives a total of 20.904 s for the lower priority cell reselection, allow 21 s in the test case.

A.4.5.2 E-UTRAN TDD – HRPD

A.4.5.2.1 E-UTRAN TDD – HRPD Cell Reselection: HRPD is of Lower Priority

A.4.5.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD- HRPD inter-RAT cell reselection requirements specified in clause 4.2.2.5.4 when the HRPD cell is of lower priority.

The test scenario comprises of one HRPD and one E-UTRAN TDD cells as given in tables A.4.5.2.1.1-1, A.4.5.2.1.1-2 and A.4.5.2.1.1-3.

The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRAN TDD cell 1 and HRPD cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell 2 is of lower priority than cell 1. Cell 1 and cell 2 shall belong to different tracking areas.

Table A.4.5.2.1.1-1: General Test Parameters for E-UTRAN TDD - lower priority HRPD Cell Reselection

	Parameter		Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell is selecting during T2
Uplink-downlink co	onfiguration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe	configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1			Normal	
DRX cycle length		S	1.28	
E-UTRA TDD RF	Channel Number		1	Only one TDD carrier frequency is used.
E-UTRA TDD Cha	nnel Bandwidth (BWchannel)	MHz	10	
HRPD RF Channe	el Number		1	Only one HRPD carrier frequency is used.
E-UTRA TDD PRA	ACH configuration of cell 1		53	As specified in table 4.7.1-3 in TS 36.211
E_UTRA TDD Acc	ess Barring Information	-	Not Sent	No additional delays in random access procedure.
T1	·	S	30	
T2		S	30	

Table A.4.5.2.1.1-2: Cell Specific Test Parameters for E-UTRAN TDD (Cell # 1)

Parameter	Parameter Unit Cell 1		
		T1	T2
E-UTRA RF Channel number		1	
BW _{channel}	MHz	1	0
OCNG Patterns defined in A.3.2.2.2			
(OP.2 TDD)		OP.2	TDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	()
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
N_{oc}	dBm/15 kHz	-g	98
RSRP	dBm/15 KHz	-89	-102
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	9	-4
\hat{E}_s/N_{oc}	dB	9	-4
Treselection _{EUTRAN}	S	()
Snonintrasearch	dB	Not	sent
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-14	40
Qrxlevminoffset	dB	()
Pcompensation	dB	()
S _{Serving} Cell	dB	51	38
Thresh _{serving, low}	dB	4	4
Propagation Condition		AW	GN
Note 1: OCNG shall be used such th	at hoth cells are fu	illy allocated and a const	ant total transmitted

Parameter Unit Cell 2 T1 T2 HRPD RF Channel Number Control E_b (38.4 kbps) dB 21 Control E_b (76.8 kbps) dB 18 N, \hat{I}_{or}/I_{oc} dB 0 0 dBm/ 1.2288 -55 MHz CDMA2000 HRPD Pilot Strength dΒ -3 -3 **Propagation Condition AWGN** SnonServingCell,x -6 Treselection 0 s hrpd-CellReselectionPriority 0 Thresh_{x, low} -14

Table A.4.5.2.1.1-3: Cell Specific Test Parameters for HRPD (cell # 2)

A.4.5.2.1.2 Test Requirements

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateHRPD} + T_{SI-HRPD}$

Where:

T_{evaluatHRPD} See Table 4.2.2.5.4-1

 $T_{\text{SI-HRPD}}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1704 ms is assumed in this test case.

This gives a total of 20.904 s for the lower priority cell reselection, allow 21 s in the test case.

A.4.6 E-UTRAN to cdma2000 1X Cell Re-Selection

A.4.6.1 E-UTRAN FDD – cdma2000 1X

A.4.6.1.1 E-UTRAN FDD – cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority

A.4.6.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD- cdma2000 1X inter-RAT cell reselection requirements specified in clause 4.2.2.5.5 when the cdma2000 1X cell is of lower priority.

The test scenario comprises of one cdma2000 1X and one E-UTRAN FDD cells as given in tables A.4.6.1.1.1-1, A.4.6.1.1.1-2 and A.4.6.1.1.1-3.

The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRAN FDD cell 1 and cdma2000 1X cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell 2 is of lower priority than cell 1. Cell 1 and cell 2 shall belong to different tracking areas.

Table A.4.6.1.1.1-1: General Test Parameters for E-UTRAN FDD - lower priority cdma2000 1X Cell Reselection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbour cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell is selecting
				during T2
DRX cycle length		S	1.28	
E-UTRA FDD RF	Channel Number		1	Only one FDD carrier frequency
				is used.
E-UTRA FDD Cha	annel Bandwidth (BW _{channel})	MHz	10	
cdma2000 1X RF	Channel Number		1	Only one cdma2000 1X carrier
				frequency is used.
E-UTRA FDD PRA	ACH configuration		4	As specified in table 5.7.1-2 in
				TS 36.211
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random
				access procedure.
T1		S	30	
T2		S	30	

Table A.4.6.1.1.1-2: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cel	Cell 1			
		T1	T2			
E-UTRA RF Channel number		1				
BW _{channel}	MHz	1()			
OCNG Patterns defined in A.3.2.1.2						
(OP.2 FDD)		OP.2	FDD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB	_				
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB	<u></u>				
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N _{oc} Note 2	dBm/15 kHz	-9	8			
RSRP Note 3	dBm/15 KHz	-89	-102			
\hat{E}_{s}/I_{ot}	dB	9	-4			
\hat{E}_s/N_{oc}	dB	9	-4			
Treselection _{EUTRAN}	S	0				
Snonintrasearch	dB	Not s	sent			
cellReselectionPriority	-	1				
Qrxlevmin	dBm	-14	10			
Qrxlevminoffset	dB	0				
Pcompensation	dB	0				
S _{Serving} Cell	dB	51	38			
Thresh _{serving, low}	dB	44	4			
Propagation Condition		AW	GN			

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

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

Parameter Unit Cell 2 <u>T1</u> **T2** cdma2000 1X RF Channel Number Pilot E_c -7 dB I_{or} Sync E_c dB -16 I_{or} Paging E_c (4.8 kbps) dB -12 \hat{I}_{or}/I_{oc} dB 0 dBm/ 1.2288 I_{oc} -55 MHz CDMA2000 1xRTT Pilot Strength dB -10 -10 AWGN **Propagation Condition** -20 SnonServingCell,x Treselection 0 s oneXRTT-CellReselectionPriority 0 Thresh_{x, low} -28

Table A.4.6.1.1.1-3: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

A.4.6.1.1.2 Test Requirements

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluatecdma2000~1X} + T_{SI-cdma2000~1X}$

Where:

T_{evaluatcdma2000 1X} See Table 4.2.2.5.5-1

 $T_{SI\text{-}cdma2000\ IX}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

A.4.6.2 E-UTRAN TDD - cdma2000 1X

A.4.6.2.1 E-UTRAN TDD –cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority

A.4.6.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD- cdma2000 1X inter-RAT cell reselection requirements specified in clause 4.2.2.5.5 when the cdma2000 1X cell is of lower priority.

The test scenario comprises of one cdma2000 1X and one E-UTRAN TDD cells as given in tables A.4.6.2.1.1-1, A.4.6.2.1.1-2 and A.4.6.2.1.1-3.

The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRAN TDD cell 1 and cdma2000 1X cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell 2 is of lower priority than cell 1. Cell 1 and cell 2 shall belong to different tracking areas.

Table A.4.6.2.1.1-1: General Test Parameters for E-UTRAN TDD - lower priority cdma2000 1X Cell Reselection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell is selecting during T2
DRX cycle length		S	1.28	
E-UTRA TDD RF	Channel Number		1	Only one TDD carrier frequency is used.
E-UTRA TDD Cha	nnel Bandwidth (BW _{channel})	MHz	10	
cdma2000 1X RF		1	Only one cdma2000 1X carrier frequency is used.	
E-UTRA TDD PRA	ACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Uplink-downlink co	onfiguration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe		6	As specified in table 4.2.1 in TS 36.211	
E_UTRA TDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		S	30	
T2	·	S	30	

Table A.4.6.2.1.1-2: Cell Specific Test Parameters for E-UTRAN TDD (Cell # 1)

Parameter	Unit	Cel	Cell 1			
		T1	T2			
E-UTRA RF Channel number		1				
BW _{channel}	MHz	1()			
OCNG Patterns defined in A.3.2.2.2						
(OP.2 TDD)		OP.2	TDD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB	_				
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note 2}$	dBm/15 kHz	-9	8			
RSRP Note 3	dBm/15 KHz	-89	-102			
\hat{E}_{s}/I_{ot}	dB	9	-4			
\hat{E}_s/N_{oc}	dB	9	-4			
Treselection _{EUTRAN}	S	0				
Snonintrasearch	dB	Not s	sent			
cellReselectionPriority	-	1				
Qrxlevmin	dBm	-14	10			
Qrxlevminoffset	dB	0				
Pcompensation	dB	0				
SservingCell	dB	51	38			
Thresh _{serving, low}	dB	44	4			
Propagation Condition		AW	GN			

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

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

Parameter Unit Cell 2 <u>T1</u> **T2** cdma2000 1X RF Channel Number Pilot E_c -7 dB I_{or} Sync E_c dB -16 Paging E_c (4.8 kbps) dB -12 \hat{I}_{or}/I_{oc} dB 0 dBm/ 1.2288 I_{oc} -55 MHz CDMA2000 1xRTT Pilot Strength dB -10 -10 AWGN **Propagation Condition** -20 SnonServingCell,x 0 Treselection s oneXRTT-CellReselectionPriority 0 Thresh_{x, low} -28

Table A.4.6.2.1.1-3: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

A.4.6.2.1.2 Test Requirements

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluatecdma2000~1X} + T_{SI-cdma2000~1X}$

Where:

 $T_{evaluatcdma2000 1X}$ See Table 4.2.2.5.5-1

 $T_{SI\text{-}cdma2000\ IX}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

A.5 E-UTRAN RRC CONNECTED Mode Mobility

A.5.1 E-UTRAN Handover

A.5.1.1 E-UTRAN FDD - FDD Intra frequency handover

A.5.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency handover requirements specified in clause 5.1.2.1.

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.5.1.1.1-1 and A.5.1.1.1-2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.5.1.1.1-1: General test parameters for E-UTRAN FDD-FDD intra frequency handover test case

Para	ameter	Unit	Value	Comment
PDSCH parameter	'S		DL Reference Measurement	As specified in clause A.3.1.1.1
			Channel R.0 FDD	
PCFICH/PDCCH/P	PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chanr	nel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth	h (BW _{channel})	MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between	en cells		3 ms	Asynchronous cells
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.1.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	Т3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD
defined in A.3.2.1.1		FDD	FDD	FDD			
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		_			_	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{ m Note~2}$	dBm/15 KHz				-98		
\hat{E}_s/N_{oc}	dB	8	8	8	- Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-87	-87
Propagation Condition					AWGN	*** 1	

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

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

A.5.1.1.2Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay $+ T_{interrupt}$, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in clause 5.1.2.1.2.

This gives a total of 50 ms.

A.5.1.2 E-UTRAN TDD - TDD Intra frequency handover

A.5.1.2.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD intra frequency handover requirements specified in clause 5.2.2.4.

The test scenario comprises of 1 E-UTRA TDD carrier and 2 cells as given in tables A.5.1.2.1-1 and A.5.1.2.1-2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.5.1.2.1-1: General test parameters for E-UTRAN TDD-TDD Intra frequency handover test case

Para	meter	Unit	Value	Comment
			DL Reference Measurement	
PDSCH parameters			Channel R.0 TDD	As specified in clause A.3.1.1.2
·			DL Reference Measurement	
PCFICH/PDCCHPH	HICH parameters		Channel R.6 TDD	As specified in clause A.3.1.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	el Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth	(BW _{channel})	MHz	10	
A3-Offset	· · · · · · · · · · · · · · · · · · ·	dB	0	
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Info	rmation	-	Not Sent	No additional delays in random access procedure.
Special subframe c	onfiguration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink cor	nfiguration		1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells			3 μs	Synchronous cells
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.1.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Intra frequency handover test case

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 TDD	OP.2 TDD	OP.1 TDD
defined in A.3.2.2.1		TDD	TDD	TDD			
(OP.1 TDD) and in							
A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		0			0	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
\hat{E}_{s}/I_{ot}	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{$	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90 -90 -90 - Infinity -87 -87					
Propagation Condition		AWGN					
Note 1: OCNG shall b	e used such that	both cells a	re fully allocation	ated and a c	onstant total tra	ansmitted powe	er spectral
density is ach	density is achieved for all OFDM symbols						

density is achieved for all OFDM symbols.

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

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

A.5.1.2.2 **Test Requirements**

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in clause 5.2.2.4.2.

This gives a total of 50 ms.

A.5.1.3 E-UTRAN FDD – FDD Inter frequency handover

A.5.1.3.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD inter-frequency handover requirements specified in clause 5.1.2.1.

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables A.5.1.3.1-1 and A.5.1.3.1-2. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

Table A.5.1.3.1-1: General test parameters for E-UTRAN FDD-FDD Inter frequency handover test case

Para	ameter	Unit	Value	Comment
PDSCH parameter	S		DL Reference Measurement	As specified in clause A.3.1.1.1
			Channel R.0 FDD	
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF chann	el number		1, 2	Two FDD carriers are used
Channel Bandwidth	າ (BW _{channel})	MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in clause A.3.3
PRACH configurati	on		4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Info	ormation	-	Not sent	No additional delays in random
				access procedure
Time offset betwee	n cells		3 ms	Asynchronous cells
Gap pattern config	Gap pattern configuration Id		0	As specified in Table 8.1.2.1-1
				started before T2 starts
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.1.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD Inter frequency handover test case

Parameter	Unit		Cell 1		Cell 2							
		T1	T2	T3	T1	T2	T3					
E-UTRA RF Channel			1			2						
number												
BW _{channel}	MHz		10			10						
OCNG Patterns		OP.1	OP.1	OP.2 FDD	OP.2	OP.2 FDD	OP.1 FDD					
defined in A.3.2.1.1		FDD	FDD		FDD							
(OP.1 FDD) and in												
A.3.2.1.2 (OP.2 FDD)												
PBCH_RA	dB											
PBCH_RB	dB											
PSS_RA	dB											
SSS_RA	dB											
PCFICH_RB	dB											
PHICH_RA	dB		•									
PHICH_RB	dB		0			0						
PDCCH_RA	dB											
PDCCH_RB	dB											
PDSCH_RA	dB											
PDSCH_RB	dB											
OCNG_RA ^{Note 1}	dB											
OCNG_RB ^{Note 1}	dB											
\hat{E}_s/I_{ot}	dB	4	4	4	-Infinity	7	7					
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98										
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7					
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	/ -91	-91					
Propagation Condition	AWGN											
Note 1: OCNG shall b	e used such that b	ooth cells a	re fully alloca	ated and a cons	stant total tra							

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

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

A.5.1.3.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in clause 5.1.2.1.2.

This gives a total of 50 ms.

A.5.1.4 E-UTRAN TDD – TDD Inter frequency handover

A.5.1.4.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD inter frequency handover requirements specified in clause 5.2.2.4.

The test scenario comprises of two E-UTRA TDD carriers and one cell on each carrier as given in tables Table A.5.1.4.1-1 and Table A.5.1.4.1-2. PDCCHs indicating new transmissions shall be sent continuously to ensure that the

UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3.

Table A.5.1.4.1-1: General test parameters for E-UTRAN TDD-TDD Inter frequency handover test case

Para	meter	Unit	Value	Comment
			DL Reference Measurement	
PDSCH parameters			Channel R.0 TDD	As specified in clause A.3.1.1.2
			DL Reference Measurement	
PCFICH/PDCCH/	PHICH PHICH		Channel R.6 TDD	As specified in clause A.3.1.2.2
parameters				
Gap Pattern Id			1	As specified in TS 36.133 clause 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
E-UTRA RF chan	nel number		1, 2	Two TDD carriers are used
Channel Bandwid	Ith (BW _{channel})	MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
DRX			DRX_L	As specified in clause A.3.3
CP length			Normal	
Access Barring In	formation	-	Not Sent	No additional delays in random access procedure.
Special subframe	configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink o	onfiguration		1	As specified in table 4.2-2 in TS 36.211
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells			3 μs	Synchronous cells
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.1.4.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Inter frequency handover test case

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1			2		
number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2 FDD	OP.2	OP.2 FDD	OP.1 FDD	
defined in A.3.2.1.1		FDD	FDD		FDD			
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB					•		
PHICH_RB	dB		0			0		
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{oc}}$	dB	4	4	4	-Infinity	7	7	
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98						
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7	
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-infinity	-91	-91	
Propagation Condition	AWGN							
Note 1: OCNG shall b	e used such that b	oth cells a	re fully alloca	ated and a cons	stant total tra	nsmitted power	r spectral	
density is achieved for all OFDM symbols								

density is achieved for all OFDM symbols.

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

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

A.5.1.4.2 **Test Requirements**

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where: NOTE:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in clause 5.2.2.4.2.

This gives a total of 50 ms.

A.5.1.5 E-UTRAN FDD – FDD Inter frequency handover: unknown target cell

A.5.1.5.1 Test Purpose and Environment

This test is to verify the FDD-FDD inter-frequency handover requirements for the case when the target cell is unknown as specified in clause 5.1.2.1.

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables A.5.1.5.1-1 and A.5.1.5.1-2. No gap patterns are configured in the test case. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and start to transmit the PRACH to Cell 2.

A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

Table A.5.1.5.1-1: General test parameters for the E-UTRAN FDD-FDD Inter frequency handover test case when the target cell is unknown

Para	ameter	Unit	Value	Comment	
PDSCH parameter	'S		DL Reference Measurement	As specified in clause A.3.1.1.1	
			Channel R.0 FDD		
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1	
			Channel R.6 FDD		
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1	
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2	
Final condition	Active cell		Cell 2		
E-UTRA RF chann	el number		1, 2	Two FDD carriers are used	
Channel Bandwidtl	h (BW _{channel})	MHz	10		
DRX			OFF	Non-DRX test	
PRACH configuration	ion		4	As specified in table 5.7.1-2 in TS	
				36.211	
Access Barring Information		-	Not sent	No additional delays in random access procedure	
Time offset between	en cells		3 ms	Asynchronous cells	
T1		S	≤5		
T2		S	1		

Table A.5.1.5.1-2: Cell specific test parameters for the E-UTRAN FDD-FDD Inter frequency handover test case when the target cell is unknown

Parameter	Unit	Cell 1		Unit Cell 1		Cell	2
		T1	T2	T1	T2		
E-UTRA RF Channel		1		2			
number							
BW _{channel}	MHz	10)	10			
OCNG Patterns		OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD		
defined in A.3.2.1.1							
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB	0		0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
\hat{E}_s/I_{ot}	dB	4	4	-Infinity	7		
$N_{oc}^{$	dBm/15 kHz			-98			
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7		
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-91		
Propagation Condition			,	AWGN			
density is ach	ieved for all OFDM	l symbols.		stant total transmitted p	•		

Interference from other cells and noise sources not specified in the test is assumed to be constant over Note 2:

subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\it oc}$ to be fulfilled.

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

A.5.1.5.2 **Test Requirements**

The UE shall start to transmit the PRACH to Cell 2 less than 130 ms from the beginning of time period T2.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms, which is specified in clause 11.2 in TS 36.331 [2].

= 115 ms in the test. See clause 5.1.2.1.2 $T_{interrupt}$

This gives a total of 130 ms.

A.5.1.6 E-UTRAN TDD – TDD Inter frequency handover; unknown Target Cell

A.5.1.6.1 Test Purpose and Environment

This test is to verify the TDD-TDD inter-frequency handover requirements for the case when the target cell is unknown as specified in clause 5.2.2.4.

The test scenario comprises of two E-UTRA TDD carriers and one cell on each carrier as given in tables A.5.1.6.1-1 and A.5.1.6.1-2. No gap patterns are configured in the test case. The test consists of two successive time periods, with time durations of T1, T2 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

Table A.5.1.6.1-1: General test parameters for the E-UTRAN TDD-TDD Inter-Frequency handover test case when the target cell is unknown

Parameter		Unit	Value	Comment
PDSCH parameter	S		DL Reference Measurement	As specified in clause A.3.1.1.2
			Channel R.0 TDD	
			DL Reference Measurement	As specified in clause A.3.1.2.2
PCFICH/PDCCH/P	PHICH parameters		Channel R.6 TDD	
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF chann	el number		1, 2	Two TDD carriers
DRX			OFF	Non-DRX test
Access Barring Info	Access Barring Information		Not sent	No additional delays in random
				access procedure
Special subframe of	configuration		6	As specified in table 4.2-1 in TS
				36.211
Uplink-downlink co	nfiguration		1	As specified in table 4.2-2 in TS
				36.211
PRACH configurati	ion		53	As specified in table 5.7.1-3 in TS
				36.211
Time offset between cells			3 μs	Synchronous cells
Gap pattern config	uration		-	No gap pattern configured
T1		S	≤5	
T2		S	1	

Table A.5.1.6.1-2: Cell specific test parameters for the E-UTRAN TDD-TDD Inter frequency handover test case when the target cell is unknown

Parameter	Unit	Cell 1		Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		•			2	
Number						
BW _{channel}	MHz	1	0	,	10	
OCNG Patterns		OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	
defined in A.3.2.2.1						
(OP.1 TDD) and in						
A.3.2.2.2 (OP.2 TDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB		_	0		
PHICH_RB	dB)			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~3}$	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	5	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	5	
Propagation Condition			A	WGN		

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.5.1.6.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 130 ms from the beginning of time period T2.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms, which is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt}$ = 115 ms in the test. See clause 5.2.2.4.2

This gives a total of 130 ms.

A.5.1.7 E-UTRAN FDD – TDD Inter frequency handover

A.5.1.7.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-TDD inter frequency handover requirements specified in clause 5.2.2.2.

The test scenario comprises of one E-UTRA FDD cell and one E-UTRA TDD cell as given in tables Table A.5.1.7.1-1, Table A.5.1.7.1-2 and Table A.5.1.7.1-3. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3.

Table A.5.1.7.1-1: General test parameters for E-UTRAN FDD-TDD Inter frequency handover test case

Parameter	Unit	Value	Comment
Cell 1 PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.1
-		Channel R.0 FDD	
Cell 1 PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1
parameters		Channel R.6 FDD	
		DL Reference Measurement	
Cell 2 PDSCH parameters		Channel R.0 TDD	As specified in clause A.3.1.1.2
		DL Reference Measurement	
Cell 2 PCFICH/PDCCH/PHICH		Channel R.6 TDD	As specified in clause A.3.1.2.2
parameters			
Gap Pattern Id		0	As specified in TS 36.133
I see I lee I lee		0.11.4	clause 8.1.2.1.
Initial conditions Active cell		Cell 1	
Neighbour cell		Cell 2	
Final conditions		Cell 2	
Cell 1 E-UTRA RF channel number		1	One FDD carrier is used
Cell 2 E-UTRA RF channel number		2	One TDD carrier is used
Channel Bandwidth (BW _{channel})	MHz	10	
A3-Offset	dB	-4	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
DRX		DRX_L	As specified in clause A.3.3
CP length		Normal	
E-UTRA TDD Access Barring	-	Not Sent	No additional delays in random
Information			access procedure.
Special subframe configuration		6	As specified in table 4.2-1 in TS
			36.211. Applicable to cell 2.
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS
			36.211. Applicable to cell 2
E-UTRA TDD PRACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	s	≤5	
T3	S	1	

Table A.5.1.7.1-2: Cell specific test parameters for E-UTRAN FDD (cell #1) in E-UTRAN FDD-TDD Inter frequency handover test case

Parameter	Unit		Cell 1		
		T1	T2	T3	
E-UTRA RF Channel number			1		
BW _{channel}	MHz		10		
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	0			
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
\hat{E}_s/I_{ot}	dB	4	4	4	
$N_{oc}^{ m Note 2}$	dBm/15 kHz		-98		
\hat{E}_s/N_{oc}	dB	4	4	4	
RSRP Note 3	dBm/15 KHz	-94	-94	-94	
Propagation Condition		AWG	N		

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

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

Table A.5.1.7.1-3: Cell specific test parameters for E-UTRAN TDD (cell #2) in E-UTRAN FDD-TDD Inter frequency handover test case

Parameter	Unit		Cell 2		
		T1	T2	T3	
E-UTRA RF Channel number			2		
BW _{channel}	MHz				
OCNG Patterns defined in		OP.2 TDD	OP.2 TDD	OP.1 TDD	
A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB		0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
\hat{E}_s/I_{ot}	dB	-Infinity	7	7	
Noc Note 2	dBm/15 kHz		-98		
\hat{E}_s/N_{oc}	dB	-Infinity	7	7	
RSRP Note 3	dBm/15 KHz	-Infinity	-91	-91	
Propagation Condition		AWG	N		

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

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

A.5.1.7.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in clause 5.2.2.4.2.

This gives a total of 50 ms.

A.5.1.8 E-UTRAN TDD – FDD Inter frequency handover

A.5.1.8.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-FDD inter-frequency handover requirements specified in clause 5.2.2.3.

The test scenario comprises of one E-UTRA TDD cell and one E-UTRA FDD cell as given in tables Table A.5.1.8.1-1, Table A.5.1.8.1-2 and Table A.5.1.8.1-3. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1,

T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

Table A.5.1.8.1-1: General test parameters for E-UTRAN TDD-FDD Inter frequency handover test case

	meter	Unit	Value	Comment
Cell 1 PDSCH para			Channel R.0 TDD	As specified in clause A.3.1.1.2
Cell 1 PCFICH/PD0	CCH/PHICH			As specified in clause A.3.1.2.2
parameters			Channel R.6 TDD	
Cell 2 PDSCH para	ımeters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
Cell 2 PCFICH/PD0	CCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1
parameters			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
Cell 1 E-UTRA RF	channel number		1	One TDD carrier is used
Cell 2 E-UTRA RF	channel number		2	One FDD carrier is used
Channel Bandwidth	(BW _{channel})	MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in clause A.3.3
E-UTRA FDD PRA	CH configuration		4	As specified in table 5.7.1-2 in TS 36.211
E-UTRA FDD Acce Information	ss Barring	-	Not sent	No additional delays in random access procedure
Time offset betwee	n cells		3 ms	Asynchronous cells
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1 started before T2 starts
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.1.8.1-2: Cell specific test parameters for E-UTRAN TDD (cell #1) in E-UTRAN TDD-FDD Inter frequency handover test case

Parameter	Unit		Cell 1		
		T1	T2	T3	
E-UTRA RF Channel number			1		
BW _{channel}	MHz		10		
OCNG Patterns defined in		OP.1 TDD	OP.1 TDD	OP.2 TDD	
A.3.2.2.1 (OP.1 TDD) and in					
A.3.2.2.2 (OP.2 TDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB		0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
\hat{E}_s/I_{ot}	dB	4	4	4	
$N_{oc}^{ m Note~2}$	dBm/15 kHz		-98		
\hat{E}_s/N_{oc}	dB	4 4		4	
RSRP Note 3	dBm/15 KHz	-94	-94	-94	
Propagation Condition		AWG	Ň		

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

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

Table A.5.1.8.1-3: Cell specific test parameters for E-UTRAN FDD (cell #2) in E-UTRAN TDD-FDD Inter frequency handover test case

Parameter	Unit		Cell 2		
		T1	T2	T3	
E-UTRA RF Channel number			2		
BW _{channel}	MHz				
OCNG Patterns defined in		OP.2 FDD	OP.2 FDD	OP.1 FDD	
A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB		0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
\hat{E}_s/I_{ot}	dB	-Infinity	7	7	
$N_{oc}^{ m Note~2}$	dBm/15 kHz		-98		
\hat{E}_s/N_{oc}	dB	-Infinity	7	7	
RSRP Note 3	dBm/15 KHz	-Infinity	-91	-91	
Propagation Condition		AWG	N		

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

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

A.5.1.8.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in clause 5.1.2.1.2.

This gives a total of 50 ms.

A.5.1.9 E-UTRAN FDD - FDD Intra frequency handover for 5MHz bandwidth

A.5.1.9.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.5.1.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.5.1.9.1-1 and A.5.1.9.1-2 will replace the values of corresponding parameters in Tables A.5.1.1.1-1 and A.5.1.1.1-2.

Table A.5.1.9.1-1: General test parameters for E-UTRAN FDD-FDD intra frequency handover test case, 5MHz

Parameter	Unit	Value	Comment	
PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.1	
		Channel R.5 FDD		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1	
·		Channel R.11 FDD		
Channel Bandwidth (BW _{channel})	MHz	5		
Note 1: See Table A.5.1.1.1-1 for other general test parameters.				
Note 2: This test is performed according	ng to the	principle defined in section A.3	3.7.2	

Table A.5.1.9.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover test case, 5MHz

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
BW _{channel}	MHz		5			5	
OCNG Patterns		OP.15	OP.15	OP.16	OP.16 FDD	OP.16 FDD	OP.15 FDD
defined in A.3.2.1.15		FDD	FDD	FDD			
(OP.15 FDD) and in							
A.3.2.1.16 (OP.16							
FDD)							
Note 1: See Table A.5	.1.1.1-2 for othe	r cell-specific	c test param	eters.			

A.5.1.9.2 Test Requirements

The requirements defined in section A.5.1.1.2 shall apply to this test case.

A.5.1.10 E-UTRAN FDD - FDD Intra frequency handover for UE category 0

A.5.1.10.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency handover requirements specified in clause 5.1.2.1.

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.5.1.10.1-1 and A.5.1.10.1-2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.5.1.10.1-1: General test parameters for E-UTRAN FDD-FDD intra frequency handover test case

Para	ameter	Unit	Value	Comment
PDSCH parameter	'S			As specified in clause A.3.1.1.3
			Channel R.13 FDD	
PCFICH/PDCCH/F	PHICH parameters			As specified in clause A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chanr	nel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidtl	h (BW _{channel})	MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random
				access procedure.
PRACH configuration	ion		4	As specified in table 5.7.1-2 in TS
				36.211
Time offset between cells			3 ms	Asynchronous cells
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.1.10.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter	Unit		Cell 1		Cell 2				
		T1	T2	T3	T1	T2	T3		
E-UTRA RF Channel			1	•		1	•		
Number									
BW _{channel}	MHz		10			10			
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD		
defined in A.3.2.1.1		FDD	FDD	FDD					
(OP.1 FDD) and in									
A.3.2.1.2 (OP.2 FDD)									
PBCH_RA	dB								
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB		•						
PDCCH_RA	dB		0			0			
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA ^{Note 1}	dB								
OCNG_RB ^{Note 1}	dB								
\hat{E}_{s}/I_{ot}	dB	8	-3.3	-3.3	-Infinity	2.36	2.36		
$N_{oc}^{ m Note~2}$	dBm/15 KHz				-98	<u> </u>			
\hat{E}_s/N_{oc}	dB	8	8	8	- Infinity	11	11		
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-87	-87		
Propagation Condition			AWGN						
	ne used such that	both cells are fully allocated and a constant total transmitted power spectral							

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

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

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

A.5.1.10.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in clause 5.1.2.1.2.

This gives a total of 50 ms.

A.5.1.11 E-UTRAN HD - FDD Intra frequency handover for UE category 0

A.5.1.11.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency handover requirements specified in clause 5.2.2.5.

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.5.1.11.1-1 and A.5.1.11.1-2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.5.1.11.1-1: General test parameters for E-UTRAN HD-FDD intra frequency handover test case

Par	Parameter		Value	Comment
PDSCH parameter	rs .		DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.3.1.2.3
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	nel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidtl	h (BW _{channel})	MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random access procedure.
PRACH configurat	ion		4	As specified in table 5.7.1-2 in TS 36.211
Time offset between	Time offset between cells		3 ms	Asynchronous cells
T1		S	5	
T2	·	S	≤5	
T3		S	1	

Table A.5.1.11.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1			1		
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD	
defined in A.3.2.1.1		FDD	FDD	FDD				
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB							
PDCCH_RA	dB		0			0		
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RANote 1	dB							
OCNG_RB ^{Note 1}	dB							
\hat{E}_{s}/I_{ot}	dB	8	-3.3	-3.3	-Infinity	2.36	2.36	
$N_{oc}^{ m Note~2}$	dBm/15 KHz	-98						
\hat{E}_s/N_{oc}	dB	8	8	8	- Infinity	11	11	
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-87	-87	
Propagation Condition		AWGN						
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral								

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

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

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

A.5.1.11.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in clause 5.2.2.5.2.

This gives a total of 50 ms.

A.5.1.12 E-UTRAN TDD - TDD Intra frequency handover for UE category 0

A.5.1.12.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD intra frequency handover requirements specified in clause 5.2.2.4.

The test scenario comprises of 1 E-UTRA TDD carrier and 2 cells as given in tables A.5.1.12.1-1 and A.5.1.12.1-2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.5.1.12.1-1: General test parameters for E-UTRAN TDD-TDD Intra frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameter	'S		DL Reference Measurement Channel R.12 TDD	As specified in clause A.3.1.1.5
PCFICH/PDCCHP	HICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chanr	nel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth	n (BW _{channel})	MHz	10	
A3-Offset	, , , , , ,	dB	0	
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random access procedure.
Special subframe of	configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink co	nfiguration		1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells			3 μs	Synchronous cells
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.1.12.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Intra frequency handover test case

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	Т3	T1	T2	T3	
E-UTRA RF Channel			1			1		
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 TDD	OP.2 TDD	OP.1 TDD	
defined in A.3.2.2.1		TDD	TDD	TDD				
(OP.1 TDD) and in								
A.3.2.2.2 (OP.2 TDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB					•		
PDCCH_RA	dB		0			0		
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
\hat{E}_{s}/I_{ot}	dB	8	-3.3	-3.3	-Infinity	2.36	2.36	
$N_{oc}^{ m Note~2}$	dBm/15 KHz				-98	•	•	
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11	
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-87	-87	
Propagation Condition			AWGN					
	e 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral							

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

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

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

A.5.1.12.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in clause 5.2.2.4.2.

This gives a total of 50 ms.

A.5.2 E-UTRAN Handover to other RATs

A.5.2.1 E-UTRAN FDD – UTRAN FDD Handover

A.5.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to UTRAN FDD handover requirements specified in clause 5.3.1.

The test parameters are given in Tables A.5.2.1.1-1, A.5.2.1.1-2 and A.5.2.1.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.2.1.1-1: General test parameters for E-UTRAN FDD to UTRAN FDD handover test case

Parameter		Unit	Value	Comment
PDSCH parameter	S		Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN cell
	Neighbouring cell		Cell 2	UTRAN cell
Final condition	Active cell		Cell 2	UTRAN cell
Channel Bandwidth	n (BW _{channel})	MHz	10	
Gap Pattern Id			0	As specified in Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD me	asurement quantity		RSRP	
Inter-RAT (UTRAN quantity	FDD) measurement		CPICH Ec/N0	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-UTF	AA	dB	-18	Absolute UTRAN CPICH Ec/lo threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Info	ormation	-	Not sent	No additional delays in random access procedure
E-UTRA RF Chann	el Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel E (BWchannel)	Bandwidth	MHz	10	
UTRA RF Channel	Number		1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.
Post-verification period			False	
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.2.1.1-2: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 1)

Parameter	Unit	Cell 1 (E-UTRA)				
		T1	T2	T3		
E-UTRA RF Channel			1			
number						
BW _{channel}	MHz		10			
OCNG Patterns		OP.1	OP.1	OP.2		
defined in A.3.2.1.1		FDD	FDD	FDD		
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB		0			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RANote 1	dB					
OCNG_RB ^{Note 1}	dB		•			
\hat{E}_s/I_{ot}	dB	0	0	0		
N_{oc}	dBm/15 kHz	-98				
\hat{E}_s/N_{oc}	dB	0 0		0		
RSRP Note 2	dBm/15 KHz	-98 -98		-98		
lo Note 2	dBm/9 MHz			-67.21		
Propagation Condition	AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a						

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

Note 2: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.5.2.1.1-3: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)		A)	
		T1	T2	Т3	
CPICH_Ec/lor	dB		-10		
PCCPCH_Ec/lor	dB		-12		
SCH_Ec/lor	dB		-12		
PICH_Ec/lor	dB	-15			
DCH_Ec/lor	dB	N/A	N/A	Note 1	
OCNS_Ec/lor	dB	-0.941	0.941	Note 2	
\hat{I}_{or}/I_{oc}	dB	-infinity	-1.8	-1.8	
I_{oc}	dBm/3,84 MHz	-70	-70	-70	
CPICH_Ec/Io	dB	-infinity	-14	-14	
Propagation Condition			AWGN		

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.

A.5.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 190 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 50 ms, which is specified in clause 5.3.1.1.1.

 $T_{interrupt} = 140$ ms in the test; $T_{interrupt}$ is defined in clause 5.3.1.1.2.

This gives a total of 190 ms.

A.5.2.2 E-UTRAN TDD - UTRAN FDD Handover

A.5.2.2.1 Test Purpose and Environment

This test is to verify the E-UTRAN TDD – UTRAN FDD handover requirements specified in clause 5.3.1.

The test scenario comprises of one E-UTRAN TDD cell and one UTRAN FDD cell as given in the tables A.5.2.2.1-1, A5.2.2.1-2 and A.5.2.2.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. At start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before the start of T2 to enable the monitoring of UTRAN FDD. A neighbouring cell list, including the UTRAN cell (cell2), shall be sent to the UE before T2 starts. During the time T2 cell 2 becomes detectable and the UE is expected to detect and send the measurement report. A RRC message implying handover shall be sent to the UE during T2, after the UE has reported event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.2.2.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD handover

Parameter		Unit	Value	Comment
•	ers (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH, (E-UTRAN TDD)	PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
	Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Final conditions	Active cell		Cell 2	
Special subframe	configuration		6	As specified in table 4.2-1 in TS 36.211. Applicable to cell 1.
Uplink-downlink o	configuration		1	As specified in table 4.2-2 in TS 36.211. Applicable to cell 1
	neasurement quantity		RSRP	
quantity	FDD) measurement		CPICH Ec/lo	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-U	TRA	dB	-18	UTRAN FDD CPICH Ec/lo threshold for event B2
Hysteresis		dB	0	
DRX			OFF	No DRX configured.
Time to Trigger		ms	0	
Filter coefficient			0	
CP length			Normal	Applicable to cell 1
Gap pattern confi			0	As specified in Table 8.1.2.1-1; to start before T2 starts
E-UTRA RF Char	nnel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel (BW _{channel})	l Bandwidth	MHz	10	
UTRA RF Chann	el Number		1	One UTRA FDD carrier frequency is used.
Monitored UTRA	FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list before T2.
Post-verification p	period		False	Post verification is not used.
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.2.2.1-2: Cell specific test parameters for E-UTRAN TDD (cell 1) for handover to UTRAN FDD (cell # 2)

Parameter	Unit	Cell 1 (E-UTRAN)		
		T1	T2	T3
E-UTRA RF Channel			1	
Number				
BW _{channel}	MHz		10	
OCNG Pattern defined				
in A.3.2.2.1 (OP.1 TDD)		OP 1	TDD	OP.2 TDD
and in A.3.2.2.2 (OP.2		01.1	100	01.2100
TDD)				
PBCH_RA	=			
PBCH_RB]			
PSS_RA]			
SSS_RA	-			
PCFICH_RB	-			
PHICH_RA			_	
PHICH_RB	dB		0	
PDCCH_RA	-			
PDCCH_RB				
PDSCH_RA	-			
PDSCH_RB	-			
OCNG_RA ^{Note 1}	-			
OCNG_RB ^{Note 1}	15 /45111			
RSRP	dBm/15 kHz	-98	-98	-98
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	0	0	0
s / ot				
\hat{E}_s/N_{oc}	dB	0	0	0
$\mathbf{L}_{s}/I\mathbf{V}_{oc}$	-	-		
N_{oc}	dBm/15 kHz		-98	I
OC Note 2			T	· ·
lo Note 2	dBm/9 MHz	-67.21	-67.21	-67.21
Propagation Condition			AWGN	

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

RSRP and lo levels have been derived from other parameters for information purposes. Note 2:

They are not settable parameters themselves.

Table A.5.2.2.1-3: Cell specific test parameters for UTRAN FDD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

Parameter	Unit	Ce	II 1 (UTRA	۹)			
		T1	T2	Т3			
CPICH_Ec/lor	dB		-10				
PCCPCH_Ec/lor	dB		-12				
SCH_Ec/lor	dB		-12				
PICH_Ec/lor	dB	-15					
DPCH_Ec/lor	dB	N/A	N/A	Note 1			
OCNS	dB	-0.941	-0.941	Note 2			
\hat{I}_{or}/I_{oc}	dB	-infinity	-1.8	-1.8			
I_{oc}	dBm/3.84 MHz	-70					
CPICH_Ec/lo	dB	-infinity	-14	-14			
Propagation Condition		AWGN					
	The DPCH level is controlled by the power control loop The power of the OCNS channel that is added shall make						

the total power from the cell to be equal to I_{or}

A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 190 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 50 ms, which is specified in clause 5.1.1.1.1.

 $T_{interrupt} = 140$ ms in the test; $T_{interrupt}$ is defined in clause 5.3.1.1.2.

This gives a total of 190 ms.

A.5.2.3 E-UTRAN FDD- GSM Handover

A.5.2.3.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN to GSM cell handover delay specified in clause 5.3.3.

The test parameters are given in Table A.5.2.3.1 -1, A.5.2.3.1 -2 and A.5.2.3.1 -3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 shall be used. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

The RRC message implying handover to cell 2 shall be sent to the UE during period T2, after the UE has reported Event B1. The start of T3 is defined as the end of last E-UTRAN TTI containing the RRC message implying handover.

The requirements are also applicable for a UE not requiring measurement gap, in which case no measurement gap pattern should be sent for the parameters specified in Table A.5.2.3.1-1.

Table A.5.2.3.1 -1: General test parameters for E-UTRAN FDD-GSM handover

Parameter		Unit	Value	Comment
PDSCH paramete	PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Gap Pattern Id	Gap Pattern Id		1	As specified in TS 36.133 section8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Inter-RAT measu	rement quantity		GSM Carrier RSSI	
Threshold other s	system	dBm	-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
T1		S	20	
T2		S	7	
T3		S	1	

Table A. A.5.2.3.1 - 2: Cell Specific Parameters for Handover from E- UTRAN FDD to GSM cell case (cell 1)

Parameter	Unit	Се	II 1					
		T1, T2	Т3					
BW _{channel}	MHz	1	0					
OCNG Patterns								
defined in A.3.2.1.1								
(OP.1 FDD) and in		OP.1 FDD OP.2 FDD						
A.3.2.1.2 (OP.2								
FDD)								
PBCH_RA	dB							
PBCH_ RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_ RB	dB							
PHICH_ RA	dB							
PHICH_ RB	dB		0					
PDCCH_ RA	dB							
PDCCH_ RB	dB							
PDSCH_ RA	dB							
PDSCH_ RB	dB							
OCNG_ RA Note1	dB							
OCNG_ RB Note1	dB							
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	4						
Noc Note 2	dBm/15 kHz	-98 (AWGN)						
	dB							
\hat{E}_s/N_{oc}			4					
RSRP Note 3	dBm/15kH z	-94						
Propagation Condition		AWGN						
transmitted power spectral density is achieved for all OFDM symbols.								
Note 2: Interference	· ·							
assumed	to be constant	t over subcarriers and time a	nd shall be modelled as					
N								
AWGN of appropriate power for N_{oc} to be fulfilled.								
	Note 3: RSRP levels have been derived from other parameters for information							
purposes. They are not settable parameters themselves.								

Table A.5.2.3.1 - 3: Cell Specific Parameters for Handover from E-UTRAN FDD to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)			
Farameter	Onit	T1	T2, T3		
Absolute RF Channel		ADECN 4			
Number		ARFCN 1			
RXLEV	dBm	-85	-75		

A.5.2.3.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 100 ms from the beginning of time period T3.

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

NOTE: The test requirement in this test case is expressed as:

 $T_{Handover delay} = 90 \text{ ms} \text{ (Table 5.3.3.2.1-1)} + T_{offset} + T_{UL}$

 T_{offset} : Equal to 4.65 ms, GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

 T_{UL} : Equal to 4.65 ms, the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame.

This gives a total of 99.3 ms, allow 100 ms in the test case.

A.5.2.4 E-UTRAN TDD - UTRAN TDD Handover

A.5.2.4.1 Test Purpose and Environment

A.5.2.4.1.1 Void

A.5.2.4.1.2 1.28 Mcps TDD option

This test is to verify the requirement for E-UTRAN TDD to UTRAN TDD handover requirements specified in clause 5.3.2.

The test scenario comprises of 1 E-UTRA TDD cell and 1 UTRA TDD cell as given in tables Table A.5.2.4.1.2-1, Table A.5.2.4.1.2-2, and Table A.5.2.4.1.2-3. Gap pattern configuration #0 as defined in table 8.1.2.1-1 is provided.

The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively.

E-UTRAN shall send a RRC message implying handover to UE. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The end of the last TTI containing handover message is begin of T3 duration.

Table A.5.2.4.1.2-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) handover test case

Parai	meter	Unit	Value	Comment	
PDSCH parame	PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2	
PCFICH/PDCC	H/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2	
parameters			Channel R.6 TDD		
Initial	Active cell		Cell 1	E-UTRA TDD cell	
conditions	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell	
Final conditions	Active cell		Cell 2		
Gap Pattern Id			0	As specified in TS 36.133 clause 8.1.2.1.	
Uplink-downlink of cell 1			1	As specified in table 4.2.2 in TS 36.211	
Special subfram of cell 1	Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211	
CP length of ce	II 1		Normal		
Time offset bety	veen cells		3 ms	Asynchronous cells	
Access Barring	Information		Not Sent	No additional delays in random access procedure.	
Assigned Sub-C	Assigned Sub-Channel		1	No additional delays in random	
Number				access procedure due to ASC.	
Hysteresis		dB	0		
Time To Trigger		S	0		
Filter coefficient			0	L3 filtering is not used	
DRX			OFF		
Ofn		dB	0		
Thresh1		dBm	-93	E-UTRA event B2 threshold	
Thresh2		dBm	-80	UTRA event B2 threshold	
T1		S	5		
T2		S	≤10		
T3		S	1		

Table A.5.2.4.1.2-2: Cell specific test parameters for E-UTRA TDD to UTRA TDD handover test case (cell 1)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel			1	
Number				
BW _{channel}	MHz		10	
OCNG Pattern defined in				
A.3.2.2.1 (OP.1 TDD)		OP 1	TDD	OP.2
and in A.3.2.1.2 (OP.2		01.1	100	TDD
TDD)			T	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	0	0	0
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
\hat{E}_{s}/I_{ot}	dB	13	-3	-3
\hat{E}_s/N_{oc}	dB	13	-3	-3
N_{oc}	dBm/15kHz	-98		
RSRP Note 2	dBm/15kHz	-85	-101	-101
SCH_RP Note 2	dBm/15 kHz	-85	-101	-101
lo Note 2	dBm/9MHz	-57.01	-68.45	-68.45
Propagation Condition			AWGN	

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

Note 2: RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves

Table A.5.2.4.1.2-3: Cell specific test parameters for cell search E-UTRA to UTRA case (cell 2)

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number			0			DwPTS	
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number Note 21			Channe				
PCCPCH_Ec/lor	dB		-3				
DwPCH_Ec/lor	dB					0	
OCNS_Ec/lor	dB		-3				
\hat{I}_{or}/I_{oc}	dB	-3	11	11	-3	11	11
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP Note 2	dBm	-86 -72 -72 n.a.					
lo Note 2	dBm/1.28 MHz	-78.24	-68.67	-68.67			
Propagation Condition		AWGN					
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary							

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note 2: PCCPCH_RSCP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.5.2.4.1.3 Void

A.5.2.4.2 Test Requirements

A.5.2.4.2.1 Void

A.5.2.4.2.2 1.28 Mcps TDD option

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 120 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 50 ms, which is specified in clause 5.3.2.2.1.

 $T_{interrupt}$ is defined in clause 5.3.2.2.2. $T_{interrupt} = 70$ ms in the test as following:

 $T_{interrupt1} = T_{offset} + T_{UL} + 30*F_{SFN} + 20 \text{ ms}$

 $T_{offset} = 10 \text{ ms}$; $T_{UL} = 10 \text{ ms}$; and $F_{SFN} = 1 \text{ for UE decoding SFN}$.

This gives a total of 120 ms.

A.5.2.4.2.3 Void

A.5.2.5 E-UTRAN FDD – UTRAN TDD Handover

A.5.2.5.1 Test Purpose and Environment

A.5.2.5.1.1 Void

A.5.2.5.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the E-UTRAN FDD to UTRAN TDD handover requirements specified in clause 5.3.2.

The test scenario comprises of two cells, E-UTRA TDD cell1 and UTRA TDD cell2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #1 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring. The test parameters are given in Tables A.5.2.5.1-1, A.5.2.5.1-2 and A.5.2.5.1-3.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.2.5.1.2-1: General test parameters for E-UTRA FDD to UTRA (1.28 Mcps TDD option) handover test case

Parar	neter	Unit	Value	Comment
PDSCH paramet	PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH parameters	/PHICH		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Initial	Active cell		Cell 1	E-UTRA FDD cell
conditions	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Final conditions	Active cell		Cell 2	
Gap Pattern Id			1	As specified in TS 36.133 clause 8.1.2.1.
E-UTRAN FDD n			RSRP	
UTRAN TDD mea			RSCP	
CP length of cell			Normal	
Access Barring Ir	nformation		Not Sent	No additional delays in random access procedure.
Assigned Sub-Ch	Assigned Sub-Channel Number		1	No additional delays in random access procedure due to ASC.
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Ofn	Ofn		0	
Thresh1		dBm	-93	Absolute E-UTRAN RSRP threshold for event B2
Thresh2	Thresh2		-80S	Absolute UTRAN RSCP threshold for event B2
T1	T1		5	
T2		S	≤ 10	
T3	T3		1	

Table A.5.2.5.1.2-2: Cell specific test parameters for E-UTRAN FDD to UTRAN (1.28 Mcps TDD option) handover test case (cell 1)

Parameter	Unit	Cell 1 (E-UTRA)					
		T1	T2	T3			
E-UTRA RF Channel			1				
number							
BW _{channel}	MHz		10				
OCNG Patterns		OP.1 FDD	OP.1 FDD	OP.2			
defined in A.3.2.1.1				FDD			
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
\hat{E}_s/N_{oc}	dB	13	-3	-3			
N_{oc}	dBm/15 kHz	-98					
\hat{E}_s/I_{ot}	dB	13	-3	-3			
RSRP Note 2	dBm/15 KHz	-85	-101	-101			
lo Note 2	dBm/9MHz	-57.01	-68.45	-68.45			
Propagation Condition			AWGN				
Note 1: OCNG shall be used such that both cells are fully allocated and a constant							

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

Note 2: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves

Table A.5.2.5.1.2-3: Cell specific test parameters for E-UTRAN FDD to UTRAN (1.28 Mcps TDD option) handover test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number Note 21		Channe			el 2		
PCCPCH_Ec/lor	dB		-3				
DwPCH_Ec/lor	dB				0		
OCNS_Ec/lor	dB	-3					
\hat{I}_{or}/I_{oc}	dB	-3	11	11	-3	11	11
I_{oc}	dBm/1.28 MHz			-80			
PCCPCH RSCP Note 2	dBm	-86	-72	-72		n.a.	
lo Note 2	dBm/1.28 MHz	-78.24	-68.67	-68.67			
Propagation Condition		AWGN					

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary

frequency's channel number.

Note 2: PCCPCH_RSCP and lo levels have been derived from other parameters for information

purposes. They are not settable parameters themselves.

A.5.2.5.1.3 Void

A.5.2.5.2 Test Requirements

A.5.2.5.2.1 Void

A.5.2.5.2.2 1.28 Mcps TDD option

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 120 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 50 ms, which is specified in clause 5.3.2.2.1.

 $T_{interrupt}$ is defined in clause 5.3.2.2.2. $T_{interrupt} = 70$ ms in the test as following:

$$T_{interrupt1} = T_{offset} + T_{UL} + 30*F_{SFN} + 20 \text{ ms}$$

 $T_{offset} = 10 \text{ ms}$; $T_{UL} = 10 \text{ ms}$; and $F_{SFN} = 1 \text{ for UE decoding SFN}$.

This gives a total of 120 ms.

A.5.2.5.2.3 Void

A.5.2.6 E-UTRAN TDD - GSM Handover

A.5.2.6.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN to GSM cell handover delay specified in clause 5.3.3.

The test parameters are given in Table A.5.2.6.1-1, A.5.2.6.1-2 and A.5.2.6.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 shall be used. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

The RRC message implying handover to cell 2 shall be sent to the UE during period T2, after the UE has reported Event B1. The start of T3 is defined as the end of last E-UTRAN TTI containing the RRC message implying handover.

The requirements are also applicable for a UE not requiring measurement gap, in which case no measurement gap pattern should be sent for the parameters specified in Table A.5.2.6.1-1.

Table A.5.2.6.1-1: General test parameters for E-UTRAN TDD toGSM neighbours handover test case in AWGN propagation condition

Pa	Parameter		Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH	/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Gap Pattern Id			1	As specified in TS 36.133 clause 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Uplink-downlink o	configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe	Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell	1		Normal	
Inter-RAT measu	rement quantity		GSM Carrier RSSI	
E-UTRA RF Char	nnel Number		1	E-UTRA RF Channel Number
E-UTRA Channel (BW _{channel})	Bandwidth	MHz	10	E-UTRA Channel Bandwidth (BW _{channel})
	Threshold other system		-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis	Hysteresis		0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
T1		S	20	
T2		S	7	
T3		S	1	

Table A.5.2.6.1-2: Cell Specific Parameters for Handover E- UTRAN TDD to GSM handover test case

Parameter	Unit	Cell 1			
		T1, T2	Т3		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD		
PBCH_RA	dB				
PBCH_ RB	dB				
PSS_ RA	dB				
SSS_RA	dB				
PCFICH_ RB	dB				
PHICH_ RA	dB	0			
PHICH_ RB	dB				
PDCCH_ RA	dB				
PDCCH_ RB	dB				
PDSCH_ RA	dB				
PDSCH_ RB	dB				
OCNG_ RA Note1	dB				
OCNG_ RB Note1	dB				
\hat{E}_s/N_{oc}	dB	4			
$N_{\ oc}$ Note 2	dBm/15 kHz	-98 (AWGN)			
\hat{E}_s/I_{ot}	dB	4			
RSRP Note 3	dBm/15kHz	-94			
Propagation Condition		AWGN			

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

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

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

Table A.5.2.6.1-3: Cell Specific Parameters for Handover E-UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)			
Farameter	Onit	T1	T2, T3		
Absolute RF Channel		ARFCN 1			
Number		AN	FON I		
RXLEV	dBm	-85	-75		

A.5.2.6.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 100 ms from the beginning of time period T3.

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

NOTE: The test requirement in this test case is expressed as:

 $T_{\text{Handover delay}} = 90 \text{ ms} \text{ (Table 5.3.3.2.1-1)} + T_{\text{offset}} + T_{\text{UL}}$

T_{offset}: Equal to 4.65 ms, GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

 T_{UL} : Equal to 4.65 ms, the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame.

This gives a total of 99.3 ms, allow 100 ms in the test case.

A.5.2.7 E-UTRAN FDD – UTRAN FDD Handover; Unknown Target Cell

A.5.2.7.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to UTRAN FDD handover requirements for the case when the target cell is unknown as specified in clause 5.3.1.

The test parameters are given in Tables A.5.2.7.1-1, A.5.2.7.1-2 and A.5.2.7.1-3. The test consists of two successive time periods, with time durations of T1, T2. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. No Gap pattern configuration shall be used.

Table A.5.2.7.1-1: General test parameters for E-UTRAN FDD to UTRAN FDD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement	As specified in clause A.3.1.1.1
1			Channel R.0 FDD	-
PCFICH/PDCCH/I	PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1
	•		Channel R.6 FDD	-
Initial conditions	Active cell		Cell 1	E-UTRAN cell
	Neighbouring cell		Cell 2	UTRAN cell
Final condition	Active cell		Cell 2	UTRAN cell
Channel Bandwidt	th (BW _{channel})	MHz	10	
E-UTRAN FDD m	easurement quantity		RSRP	
Inter-RAT (UTRAN FDD) measurement quantity			CPICH Ec/N0	
DRX	DRX		OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random
				access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier
				frequency is used.
E-UTRA Channel	Bandwidth	MHz	10	
(BWchannel)				
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel
				1 provided in the cell before T2.
Post-verification p	eriod		False	
T1		S	≤5	
T2		S	1	

Table A.5.2.7.1-2: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 1)

Parameter	Unit	Cell 1 (E-UTRA)				
		T1 T2				
E-UTRA RF Channel		1				
number						
BW _{channel}	MHz	•	10			
OCNG Patterns defined in		OP.1 FDD	OP.2 FDD			
A.3.2.1.1 (OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB		0			
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PDSCH_RA	dB	1				
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB	1				
OCNG_RB ^{Note 1}	dB	1				
\hat{E}_s/I_{ot}	dB	0	0			
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-!	98			
\hat{E}_s/N_{oc}	dB	0	0			
RSRP Note 3	dBm/15 KHz	-98	-98			
Propagation Condition		AW	/GN			
a constant total tran for all OFDM symbo	a constant total transmitted power spectral density is achieved for all OFDM symbols. Interference from other cells and noise sources not specified in					
the test is assumed	to be constant	over subcarrier	s and time			
and shall be model	and shall be modelled as AWGN of appropriate power for N_{oc}					

to be fulfilled.

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

themselves.

Table A.5.2.7.1-3: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	
CPICH_Ec/lor	dB	-	10	
PCCPCH_Ec/lor	dB	-	12	
SCH_Ec/lor	dB	-	12	
PICH_Ec/lor	dB	-15		
DCH_Ec/lor	dB	Note 1		
OCNS_Ec/lor	dB	Note 2		
\hat{I}_{or}/I_{oc}	dB	-infinity	-1.8	
I_{oc}	dBm/3,84 MHz	-70	-70	
CPICH_Ec/lo	dB	-infinity	-14	
Propagation Condition	AWGN			

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.

A.5.2.7.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 290 ms from the beginning of time period T2.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay is 50ms. See clause 5.3.1.1.1.

 $T_{interrupt}$ is 240ms. See clause 5.3.1.1.2.

This gives a total of 290ms in the test case.

A.5.2.8 E-UTRAN FDD - GSM Handover; Unknown Target Cell

A.5.2.8.1 Test Purpose and Environment

This test is to verify the E-UTRAN FDD to GSM handover requirements for the case when the target GSM cell is unknown as specified in clause 5.3.3.

The test parameters are given in Table A.5.2.8.1-1, A.5.2.8.1-2 and A.5.2.8.1-3 below. The test consists of two successive time periods, with time duration of T1, T2 respectively. At the start of time duration T1, the UE will not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. No Gap pattern configuration shall be used.

Table A.5.2.8.1-1: General test parameters for E-UTRAN FDD to GSM handover test case; unknown target cell

Para	meter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Final conditions		Cell 2	
DRX			OFF	No DRX configured
T1		S	7	
T2		S	1	

Table A.5.2.8.1 - 2: Cell specific parameters for cell # 1 in E-UTRAN FDD to GSM handover test case; unknown target cell

Parameter Unit		Cell 1				
		T1	T2			
BW _{channel}	MHz		10			
OCNG Patterns						
defined in A.3.2.1.1						
(OP.1 FDD) and in		OP.1 FDD	OP.2 FDD			
A.3.2.1.2 (OP.2						
FDD)						
PBCH_RA	dB					
PBCH_ RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_ RB	dB					
PHICH_ RA	dB					
PHICH_ RB	dB		0			
PDCCH_ RA	dB					
PDCCH_RB dB						
PDSCH_ RA	dB					
PDSCH_ RB	dB					
OCNG_RA Note1	dB					
OCNG_ RB Note1	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4				
$N_{oc}^{ m Note~2}$	dBm/15 kHz		-98			
\hat{E}_s/N_{oc}	dB		4			
RSRP Note 3	dBm/15 kHz		-94			
Propagation		٨	WGN			
Condition						
		hat cell 1 is fully allocate				
transmitted power spectral density is achieved for all OFDM symbols.						
	Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as					
			ind shall be modelled as			
AVA/CNI of	annronriato novo	er for N_{oc} to be fulfilled.				
Note 3: RSRP leve	appiopilale powe	rived from other paramet	ers for information			
purposes. They are not settable parameters themselves.						

Table A.5.2.8.1-3: Cell specific parameters for cell # 2 in E-UTRAN FDD to GSM handover test case; unknown target cell

Parameter	Unit	Cell 2 (GSM)			
Farameter	Onit	T1 T2		T1 T2	T2
Absolute RF Channel Number		AR	FCN 1		
RXLEV	dBm	-Infinity	-75		

A.5.2.8.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 200 ms from the beginning of time period T2.

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

NOTE: The test requirement in this test case is expressed as:

 $T_{Handover delay}$ = 190 ms (Table 5.3.3.2.1-1) + T_{offset} + T_{UL}

 T_{offset} : Equal to 4.65 ms is the GSM timing uncertainty from the time when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{III}: Equal to 4.65 ms is the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame.

This gives a total of 199.3 ms, allow 200 ms in the test case.

A.5.2.9 E-UTRAN TDD - GSM Handover; Unknown Target Cell

A.5.2.9.1 Test Purpose and Environment

This test is to verify the E-UTRAN TDD to GSM handover requirements for the case when the target GSM cell is unknown as specified in clause 5.3.3.

The test parameters are given in Table A.5.2.9.1 -1, A.5.2.9.1 -2 and A.5.2.9.1 -3 below. The test consists of two successive time periods, with time duration of T1, T2 respectively. At the start of time duration T1, the UE will not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. No Gap pattern configuration shall be used.

Table A.5.2.9.1-1: General test parameters for E-UTRAN TDD to GSM handover test case; unknown target cell

Para	meter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement	As specified in clause A.3.1.1.2
			Channel R.0 TDD	
PCFICH/PDCCH	/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2
parameters			Channel R.6 TDD	
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
DRX			OFF	No DRX configured
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink o	configuration		1	As specified in table 4.2-2 in TS 36.211
T1		S	7	
T2		S	1	

Table A.5.2.9.1 - 2: Cell specific parameters for cell # 1 in E-UTRAN TDD to GSM handover test case; unknown target cell

Parameter Unit		Cell 1				
		T1	T2			
BW _{channel}	MHz		10			
OCNG Patterns						
defined in A.3.2.2.1						
(OP.1 TDD) and in		OP.1 TDD	OP.2 TDD			
A.3.2.2.2 (OP.2						
TDD)						
PBCH_RA	dB					
PBCH_ RB	dB					
PSS_ RA	dB					
SSS_RA	dB					
PCFICH_ RB	dB					
PHICH_ RA	dB					
PHICH_ RB	dB		0			
PDCCH_ RA dB						
PDCCH_ RB	dB					
PDSCH_ RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_ RB Note1	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4				
$N_{oc}^{ m Note~2}$	dBm/15 kHz		-98			
\hat{E}_s/N_{oc}	dB		4			
RSRP Note 3	dBm/15 kHz		-94			
Propagation		٨	.WGN			
Condition		A	wwGN			
		hat cell 1 is fully allocate				
transmitted power spectral density is achieved for all OFDM symbols.						
Note 2: Interference from other cells and noise sources not specified in the test is						
		er subcarriers and time a	and shall be modelled as			
AMCN of	annranriata nawa	er for N_{oc} to be fulfilled.				
Note 3: RSRP leve	appropriate powe	rived from other paramet	ers for information			
purposes. They are not settable parameters themselves.						

Table A.5.2.9.1 - 3: Cell specific parameters for cell # 2 in E-UTRAN TDD to GSM handover test case; unknown target cell

Parameter	Unit	Cell 2 (GSM)			
Farameter	Onit	T1 T2		T1 T2	T2
Absolute RF Channel Number		AR	FCN 1		
RXLEV	dBm	-Infinity	-75		

A.5.2.9.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 200 ms from the beginning of time period T2.

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

NOTE: The test requirement in this test case is expressed as:

 $T_{Handover delay}$ = 190 ms (Table 5.3.3.2.1-1) + T_{offset} + T_{UL}

 T_{offset} : Equal to 4.65 ms is the GSM timing uncertainty from the time when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{III}: Equal to 4.65 ms is the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame.

This gives a total of 199.3 ms, allow 200 ms in the test case.

A.5.2.10 E-UTRAN TDD to UTRAN TDD handover: unknown target cell

A.5.2.10.1 Test Purpose and Environment

This test is to verify the requirement for E-UTRAN TDD to UTRAN TDD handover requirements specified in clause 5.3.2 when the target UTRAN TDD cell is unknown.

The test scenario comprises of 1 E-UTRAN TDD cell and 1 UTRAN TDD cell as given in tables A.5.2.10.1-1, A.5.2.10.1-2, and A.5.2.10.1-3. No gap pattern is configured in the test case.

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, a RRC message implying handover to UTRA 1.28Mcps TDD cell shall be sent to the UE. The end of the last TTI containing handover message is the beginning of T2 duration.

Table A.5.2.10.1-1: General test parameters for E-UTRAN TDD to unknown UTRAN TDD cell handover test case

Parar	neter	Unit	Value	Comment
PDSCH param	neters		DL Reference	As specified in clause A.3.1.1.2
			Measurement Channel R.0 TDD	
PCFICH/PDCC	CH/PHICH		DL Reference	As specified in clause A.3.1.2.2
parameters			Measurement Channel	
•			R.6 TDD	
Initial	Active cell		Cell 1	E-UTRAN TDD cell
conditions	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD cell
Final conditions	Active cell		Cell 2	UTRA 1.28Mcps TDD cell
CP length of cell 1			Normal	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subfrai			6	As specified in table 4.2.1 in TS 36.211
configuration o	of cell 1			
Time offset bet			3 ms	Asynchronous cells
Access Barring Information			Not Sent	No additional delays in random access procedure.
Assigned Sub- Number	Channel		1	No additional delays in random access procedure due to ASC.
TimeToTrigger	•	s	0	procedure due to ASC.
Filter coefficient		3	0	L3 filtering is not used
DRX			OFF	Lo intorning to flot dood
T1		S	5	During T1, cell 2 shall be powered off, and during the off time the physical layer cell identity shall be changed.
T2		S	1	

Table A.5.2.10.1-2: Cell specific test parameters for E-UTRAN TDD to unknown UTRAN TDD cell handover test case (cell 1)

Parameter	Unit	Cell 1				
		T1	T2			
E-UTRA RF Channel			1			
Number						
BWchannel	MHz	1	10			
OCNG Patterns defined in		OP.1 TDD	OP.2 TDD			
TS36.133 A.3.2.2.1 (OP.1						
TDD) and in A.3.2.2.2						
(OP.2 TDD)	40					
PBCH_RA	dB	1				
PBCH_RB	dB	1				
PSS_RA	dB	1				
SSS_RA	dB	1				
PCFICH_RB	dB	_				
PHICH_RA	dB					
PHICH_RB	dB	0	0			
PDCCH_RA	dB	_				
PDCCH_RB	dB	_				
PDSCH_RA	dB					
PDSCH_RB	dB	_				
OCNG_RANote 1	dB	_				
OCNG_RBNote 1	dB		_			
\hat{E}_s/I_{ot}	dB	3	3			
\hat{E}_s/N_{oc}	dB	3	3			
N_{oc}	dBm/15kHz	-98				
RSRP	dBm/15kHz	-95	-95			
SCH_RP	dBm/15 kHz	-95	-95			
Propagation Condition		AWGN				
Note 1: OCNG shall be used such that cell is fully allocated and a						

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

Note 2: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable

parameters themselves.

Table A.5.2.10.1-3: Cell specific test parameters for E-UTRAN TDD to unknown UTRAN TDD cell test case (cell 2)

Unit		Cell 2 (UTRA)		
	0		DwF	PTS
	T1	T2	T1	T2
		Chan	nel 2	
dB	-(3		
dB			0	
dB	-(3		
dB	-infinity	13	-infinity	13
dBm/1.28 MHz		-8	30	
dBm	-infinity	-70	n.a	a.
		AW	'GN	
	dB dB dB dB dB dBm/1.28 MHz	dB -: dB dB -: dB -infinity dBm/1.28 MHz dBm -infinity	0 T1 T2 Char Char dB -3 dB -3 dB -infinity 13 dBm/1.28 MHz -5 dBm -infinity -70 AW AW	O DWF T1 T2 T1 T2 T1 T2 T1 T2 T1 T3 T4 T5 T5 T5 T5 T5 T5 T5

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note2: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.5.2.10.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 280 ms from the beginning of time period T2.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 50 ms, which is specified in clause 5.3.2.2.1.

 $T_{interrupt}$ is defined in clause 5.3.2.2.2. $T_{interrupt} = 230$ ms in the test as following:

 $T_{offset} = 10 \text{ ms}$; $T_{UL} = 10 \text{ ms}$; and $F_{SFN} = 1 \text{ for UE decoding SFN}$.

This gives a total of 280 ms.

A.5.2.10A E-UTRAN FDD – UTRAN FDD Multicarrier Handover with two target cells

A.5.2.10A.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to UTRAN FDD handover requirements specified in clause 5.3.1 in a 2 cell multicarrier configuration. It is applicable to UEs that support DC-HSDPA, DB-DC-HSDPA and which do not support 3C-HSDPA or 4C-HSDPA.

The test parameters are given in Tables A.5.2.10A.1-1, A.5.2.10A.1-2 and A.5.2.10A.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 and cell 3 become detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover to cell 2 and cell 3 shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target Primary Serving HS-DSCH cell and cell 3 as the target Secondary Serving HS-DSCH cell.

Table A.5.2.10A.1-1: General test parameters for E-UTRAN FDD to UTRAN FDD handover test case

Parameter		Unit	Value	Comment	
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1	
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1	
	Active cell		Cell 1	E-UTRAN cell	
	Neighbouring cell		Cell 2	UTRAN cell	
	Active cell		Cell 2 and cell 3	UTRAN cell	
Channel Bandwidth	(BW _{channel})	MHz	10		
Gap Pattern Id			0	As specified in Table 8.1.2.1-1 started before T2 starts	
E-UTRAN FDD mea	asurement quantity		RSRP		
Inter-RAT (UTRAN FDD) measurement quantity			CPICH Ec/lo		
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2	
b2-Threshold2-UTRA		dB	-18	Absolute UTRAN CPICH Ec/Io threshold for event B2	
Hysteresis		dB	0		
TimeToTrigger		S	0		
Filter coefficient			0	L3 filtering is not used	
DRX			OFF	Non-DRX test	
Access Barring Information		-	Not sent	No additional delays in random access procedure	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.	
E-UTRA Channel Bandwidth (BWchannel)		MHz	10		
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.	
	Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.	
Post-verification period			False		
T1		S	5		
T2		S	≤5		
T3		S	1		

Table A.5.2.10A.1-2: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 1)

Parameter	Unit	Cell 1 (E-UTRA)			
		T1	T2	Т3	
E-UTRA RF Channel			1		
number					
BW _{channel}	MHz		10		
OCNG Patterns		OP.1	OP.1	OP.2	
defined in A.3.2.1.1		FDD	FDD	FDD	
(OP.1 FDD) and in					
A.3.2.1.2 (OP.2 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB	1			
PDSCH_RA	dB	1			
PDSCH_RB	dB	1			
OCNG_RA ^{Note 1}	dB	1			
OCNG_RB ^{Note 1}	dB]			
\hat{E}_s/I_{ot}	dB	0	0	0	
N_{oc}	dBm/15 kHz	-98			
\hat{E}_s/N_{oc}	dB	0 0		0	
RSRP Note 2	dBm/15 KHz	-98	-98	-98	
lo Note 2	dBm/9 MHz	-67.21 -67.21 -67.2		-67.21	
Propagation Condition		AWGN			

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

Note 2: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.5.2.10A.1-3: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD multi carrier handover test case (cell 2 and cell 3)

		Cell 2		Cell 3			
		T1	T2	T3	T1	T2	T3
JTRA RF Channel Number		Channel 1			Channel 2		
Cell type		Primary Serving HS-DSCH Secondary Serving HS Cell Cell		S-DSCH			
CPICH_Ec/lor	dB	-10 -10					
PCCPCH_Ec/lor	dB	-12 -12					
SCH_Ec/lor	dB	-12 -12		-12			
PICH_Ec/lor	dB	-15 -15					
HS-SCCH_Ec/lor	dB	-13 -13					
HS_DPDCH_Ec/lor	dB	-10 -10					
DPCH_Ec/lor	dB	Note 1 N/A					
OCNS			Note 2 -2.02				
\hat{I}_{or}/I_{oc}	dB	-Inf	-1.8	-1.8	-Inf	-1.8	-1.8
I_{oc}	dBm/3.8 MHz	- /()			•		
Propagation Condition		AWGN AWGN					

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to $I_{\rm or}$ Note 3: The UE shall be scheduled continuously with HS-DSCH data during T3 using both cell 2 and cell 3

A.5.2.10A.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 210 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay $+ T_{interrupt}$, where:

RRC procedure delay = 50 ms, which is specified in clause 5.3.1.1.1.

 $T_{interrupt} = 160$ ms in the test; $T_{interrupt}$ is defined in clause 5.3.1.1.2.

This gives a total of 210 ms.

A.5.2.10B E-UTRAN TDD – UTRAN FDD Multicarrier Handover with two target cells

A.5.2.10B.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD to UTRAN FDD handover requirements specified in clause 5.3.1 in a 2 cell multicarrier configuration. It is applicable to UEs that support DC-HSDPA, DB-DC-HSDPA and which do not support 3C-HSDPA or 4C-HSDPA.

The test parameters are given in Tables A.5.2.10B.1-1, A.5.2.10B.1-2 and A.5.2.10B.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 and cell 3 become detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover to cell 2 and cell 3 shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target Primary Serving HS-DSCH cell and cell 3 as the target Secondary Serving HS-DSCH cell.

Table A.5.2.10B.1-1: General test parameters for E-UTRAN TDD to UTRAN FDD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
	Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Final conditions	Active cell		Cell 2 and cell 3	
	Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. Applicable to cell 1.
Uplink-downlink c	onfiguration		1	As specified in table 4.2-2 in TS 36.211. Applicable to cell 1
	easurement quantity		RSRP	
quantity	FDD) measurement		CPICH Ec/lo	
b2-Threshold1	b2-Threshold1		-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-UTRA		dB	-18	UTRAN FDD CPICH Ec/lo threshold for event B2
Hysteresis		dB	0	
DRX			OFF	No DRX configured.
Time to Trigger		ms	0	
Filter coefficient			0	
CP length			Normal	Applicable to cell 1
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1; to start before T2 starts
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel (BW _{channel})	E-UTRA Channel Bandwidth		10	
	UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell list before T2.
Post-verification period		İ	False	Post verification is not used.
T1		S	5	
T2		S	≤ 5	
T3	·	S	1	

Table A.5.2.10B.1-2: Cell specific test parameters for E-UTRAN TDD to UTRAN FDD handover test case (cell 1)

Parameter	Unit	Cell 1 (E-UTRAN)				
		T1	T2	T3		
E-UTRA RF Channel			1			
Number						
BW _{channel}	MHz	10				
OCNG Pattern defined						
in A.3.2.2.1 (OP.1 TDD)		OP.1 TDD OP.2 TI				
and in A.3.2.2.2 (OP.2		01.1	100	01.2 100		
TDD)						
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB	dB	0				
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA ^{Note 1}						
OCNG_RB ^{Note 1}						
RSRP	dBm/15 kHz	-98	-98	-98		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	0	0	0		
L _s /I _{ot}		-				
<u> </u>	dB	0	0	0		
\hat{E}_s/N_{oc}	uБ	U	U	U		
N_{oc}	dBm/15 kHz	-98				
lo Note 2	dBm/9 MHz	-67.21	-67.21	-67.21		
Propagation Condition		AWGN				

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

Note 2: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.5.2.10B.1-3: Cell specific test parameters for E-UTRAN TDD to UTRAN FDD multi carrier handover test case (cell 2 and cell 3)

T1 T2 T3 T1 T2			
Cell type Primary Serving HS-DSCH Cell Secondary Serving Cell CPICH_Ec/lor dB -10 -10 PCCPCH_Ec/lor dB -12 -12 SCH_Ec/lor dB -12 -12 PICH_Ec/lor dB -15 -15 HS-SCCH_Ec/lor dB -13 -13 HS_DPDCH_Ec/lor dB -10 -10 DPCH_Ec/lor dB Note 1 N/A			
Cell type Cell Cell CPICH_Ec/lor dB -10 -10 PCCPCH_Ec/lor dB -12 -12 SCH_Ec/lor dB -12 -12 PICH_Ec/lor dB -15 -15 HS-SCCH_Ec/lor dB -13 -13 HS_DPDCH_Ec/lor dB -10 -10 DPCH_Ec/lor dB Note 1 N/A	g HS-DSCF		
PCCPCH_Ec/lor dB -12 -12 SCH_Ec/lor dB -12 -12 PICH_Ec/lor dB -15 -15 HS-SCCH_Ec/lor dB -13 -13 HS_DPDCH_Ec/lor dB -10 -10 DPCH_Ec/lor dB Note 1 N/A			
SCH_Ec/lor dB -12 -12 PICH_Ec/lor dB -15 -15 HS-SCCH_Ec/lor dB -13 -13 HS_DPDCH_Ec/lor dB -10 -10 DPCH_Ec/lor dB Note 1 N/A			
PICH_Ec/lor dB -15 -15 HS-SCCH_Ec/lor dB -13 -13 HS_DPDCH_Ec/lor dB -10 -10 DPCH_Ec/lor dB Note 1 N/A			
HS-SCCH_Ec/lor dB -13 -13 HS_DPDCH_Ec/lor dB -10 -10 DPCH_Ec/lor dB Note 1 N/A			
HS_DPDCH_Ec/lor dB -10 -10 DPCH_Ec/lor dB Note 1 N/A	-15		
DPCH_Ec/lor dB Note 1 N/A	-13		
0010			
OCNS Note 2 -2.02			
\hat{I}_{or}/I_{oc} dB -Inf -1.8 -1.8 -Inf -1.8	-1.8		
I _{oc} dBm/3.84 -70	•		
Propagation Condition AWGN AWG	AWGN AWGN		

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to $I_{\rm or}$ Note 3: The UE shall be scheduled continuously with HS-DSCH data during T3 using both cell 2 and cell 3

A.5.2.10B.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 210 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay $+ T_{interrupt}$, where:

RRC procedure delay = 50 ms, which is specified in clause 5.3.1.1.1.

 $T_{interrupt} = 160$ ms in the test; $T_{interrupt}$ is defined in clause 5.3.1.1.2.

This gives a total of 210 ms.

A.5.2.11 E-UTRAN FDD – UTRAN FDD Handover for 5MHz Bandwidth

A.5.2.11.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.5.2.1.1.

The parameters of this test are the same as defined in Subclause A.5.2.1.1 except that the values of the parameters in the Table A.5.2.11.1-1 will replace the values of the corresponding parameters in A.5.2.1.1-1, and the values of the parameters in the Table A.5.2.11.1-2 will replace the values of the corresponding parameters in A.5.2.1.1-2.

Table A.5.2.11.1-1: General test parameters for E-UTRAN FDD to UTRAN FDD handover test case for 5MHz bandwidth

Parameter	Unit	Value	Comment		
PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.1		
		Channel R.5 FDD			
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1		
		Channel R.11 FDD			
E-UTRA Channel Bandwidth	MHz	5			
(BWchannel)					
Note 1: See Table A.5.2.1.1-1 for other general test parameters.					
Note 2: This test is according to the pr	inciple d	efined in section A.3.7.2.			

Table A.5.2.11.1-2: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 1)

Pa	rameter	Unit	Cell 1 (E-UTRA)					
			T1	T2	Т3			
BW _{channel}		MHz		5				
OCNG P	atterns		OP.15	OP.15	OP.16			
defined in	n A.3.2.1.15		FDD	FDD	FDD			
(OP.15 F	DD) and in							
A.3.2.1.1	6 (OP.16							
FDD)	•							
lo Note 2		dBm/4.5 MHz	-70.22	-70.22	-70.22			
Note 1:	OCNG shall b	e used such that b	ooth cells a	re fully alloc	ated and a			
	constant total	tant total transmitted power spectral density is achieved for all						
	OFDM symbo	ymbols.						
Note 2:	RSRP and lo	P and lo levels have been derived from other parameters for						
		ation purposes. They are not settable parameters themselves.						
Note 3:	See Table A.5	.2.1.1-2 for other	cell specifi	c test param	eters.			

A.5.2.11.2 Test Requirements

The test requirements defined in section A.5.2.1.2 shall apply to this test case.

A.5.3 E-UTRAN Handover to Non-3GPP RATs

A.5.3.1 E-UTRAN FDD – HRPD Handover

A.5.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to HRPD handover requirements specified in clause 5.4.1.

The test parameters are given in Tables A.5.3.1.1-1, A.5.3.1.1-2 and A.5.3.1.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.1.1-1: General test parameters for E-UTRAN FDD to HRPD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Initial conditions			Cell 1	E-UTRAN FDD cell
Ne	ighbouring cell		Cell 2	HRPD cell
	tive cell		Cell 2	HRPD cell
Channel Bandwidth (B'	W _{channel})	MHz	10	
Gap Pattern Id	·		0	As specified in Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measu	rement quantity		RSRP	
Inter-RAT (HRPD) mea			CDMA2000 HRPD Pilot	
quantity			Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Informa	ation	-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel N	lumber		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Band (BWchannel)	dwidth	MHz	10	,
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
HRPD neighbour cell list size			8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWind	dowSize		8 (60 PN chips)	Search window size as defined in clause 6.3.5 in TS 36.331
T1		S	5	
T2		S	≤10	
T3		S	1	

Table A.5.3.1.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to HRPD cell # 2

Parameter	Unit	Cell 1 (E-UTRA)				
		T1 T2 T3		T3		
E-UTRA RF Channel		1				
number						
BW _{channel}	MHz		10			
OCNG Patterns defined in		OP.1	FDD	OP.2		
A.3.2.1.1 (OP.1 FDD) and				FDD		
in A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PDSCH_RA	dB	7				
PDSCH_RB	dB	7				
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~2}$	dBm/15		-98			
	kHz					
RSRP Note 3	dBm/15	-98 -98 -9		-98		
	KHz					
\hat{E}_s/N_{oc}	dB	0 0 0		0		
\hat{E}_s/I_{ot}	dB	0 0 0				
Propagation Condition		AWGN				

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

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

Table A.5.3.1.1-3: Cell specific test parameters for HRPD (cell # 2) for handover from E-UTRAN FDD cell (cell #1)

Parameter	Unit	Cell 2 (HRPD)			
		T1	T2	Т3	
$\frac{\text{Control} \text{E}_{\text{b}}}{\text{N}_{\text{t}}} \text{(38.4 kbps)}$	dB		21		
$\frac{\text{Control} E_{\text{b}}}{N_{\text{t}}} \text{ (76.8 kbps)}$	dB	18			
\hat{I}_{or}/I_{oc}	dB	-infinity	0	0	
I_{oc}	dBm/1.2288 MHz		-55		
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	-3	
Propagation Condition			AWGN		

A.5.3.1.2 Test Requirements

The UE shall start transmission of the reverse control channel in HRPD to Cell 2 less than 127 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 50 ms, which is specified in clause 5.4.1.1.1.

 $T_{interrupt} = 76.66$ ms in the test; $T_{interrupt}$ is defined in clause 5.4.1.1.2.

This gives a total of 126.66 ms, allow 127 ms in the test.

A.5.3.2 E-UTRAN FDD – cdma2000 1X Handover

A.5.3.2.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to cdma2000 1X handover requirements specified in clause 5.4.2.

The test parameters are given in Tables A.5.3.2.1-1, A.5.3.2.1-2 and A.5.3.2.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.2.1-1: General test parameters for E-UTRAN FDD to cdma2000 1X handover test case

Para	meter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth	n (BW _{channel})	MHz	10	
Gap Pattern Id			0	As specified in Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD me	asurement quantity		RSRP	
quantity	00 1X) measurement		CDMA2000 1xRTT Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Info	ormation	-	Not sent	No additional delays in random access procedure
E-UTRA RF Chann	el Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel E (BWchannel)	andwidth	MHz	10	
cdma2000 1X RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000 1X neighbour cell list size			8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-Search\	VindowSize		8 (60 PN chips)	Search window size as defined in clause 6.3.5 in TS 36.331
T1		S	5	
T2		S	≤10	
T3		S	1	

Table A.5.3.2.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to cdma2000 1X cell #2

Parameter	Unit	C	ell 1 (E-UTR	A)		
		T1	T2	T3		
E-UTRA RF Channel			1			
number						
BW _{channel}	MHz		10			
OCNG Patterns defined in		OP.1	FDD	OP.2		
A.3.2.1.1 (OP.1 FDD) and				FDD		
in A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N_{oc} Note 2	dBm/15		-98			
	kHz		T	ı		
RSRP Note 3	dBm/15	-98	-98	-98		
	KHz					
\hat{E}_s/N_{oc}	dB	0	0	0		
\hat{E}_s/I_{ot}	dB	0	0	0		
Propagation Condition		AWGN				
	e used such that both cells are fully allocated and a					
constant total tran OFDM symbols.	smitted powe	r spectral de	nsity is achie	ved for all		
	other cells an	d noise sour	ces not speci	ified in the		
	e 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall					
			N			
			. N			

be modelled as AWGN of appropriate power for $^{N_{oc}}$ to be fulfilled. RSRP levels have been derived from other parameters for

Note 3:

information purposes. They are not settable parameters themselves.

Table A.5.3.2.1-3: Cell specific test parameters for cdma2000 1X (cell # 2) for handover from E-UTRAN FDD cell (cell #1)

Parameter	Unit	Cell 2 (cdma2000 1X)			
		T1	T2	Т3	
Pilot E _c	dB	-7			
$\begin{array}{c c} Sync & E_c \\ \hline I_{or} \end{array}$	dB	-16			
$\frac{\text{Paging} \text{E}_{c}}{\text{I}_{\text{or}}} \text{(4.8 kbps)}$	dB	-12			
\hat{I}_{or}/I_{oc}	dB	-infinity 0 0		0	
I_{oc}	dBm/1.2288 MHz		-55		
CDMA2000 1xRTT Pilot Strength	dB	-infinity -10 -1		-10	
Propagation Condition		AWGN			

A.5.3.2.2 Test Requirements

The UE shall start transmission of the reverse control channel in cdma2000 1X to Cell 2 less than 300 ms from the beginning of time period T3.

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 130 ms, which is specified in clause 5.4.2.1.1.

 $T_{interrupt} = 170$ ms in the test; $T_{interrupt}$ is defined in clause 5.4.2.1.2.

This gives a total of 300 ms.

A.5.3.3 E-UTRAN FDD – HRPD Handover; Unknown Target Cell

A.5.3.3.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to HRPD handover requirements for the case when the target HRPD cell is unknown as specified in clause 5.4.1.

The test parameters are given in Tables A.5.3.3.1-1, A.5.3.3.1-2 and A.5.3.3.1-3. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. During time period T1, message containing Information Element *systemTimeInfo* as defined in clause 6.3.1 of TS 36.331 [2] shall be sent by the System Simulator (SS). No gap patterns are configured in the test case. No HRPD neighbour cell list shall be provided to the UE.

A RRC message implying handover to the unknown HRPD cell shall be sent to the UE towards the end of the time period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.3.1-1: General test parameters for E-UTRAN FDD to HRPD handover test case; unknown target HRPD cell

Par	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidt	h (BW _{channel})	MHz	10	
DRX			OFF	Non-DRX test
Access Barring Inf	Access Barring Information		Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in clause 6.3.5 in TS 36.331
T1		S	≤5	
T2		S	1	

Table A.5.3.3.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to unknown HRPD cell # 2

Parameter	Unit	Cell 1 (E-UTRAN FDD)			
		T1 T2			
E-UTRA RF Channel			1		
number					
BW _{channel}	MHz	1	0		
OCNG Patterns defined in		OP.1	FDD		
A.3.2.1.1 (OP.1 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB		0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-9	98		
RSRP Note 3	dBm/15 kHz	-98	-98		
\hat{E}_s/N_{oc}	dB	0	0		
\hat{E}_s/I_{ot}	dB	0	0		
Propagation Condition		AWGN			

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

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

Table A.5.3.3.1-3: Cell specific test parameters for unknown HRPD (cell # 2) for handover from E-UTRAN FDD cell (cell #1)

Parameter	Unit	Cell 2 (HRPD)		
		T1	T2	
E_b (38.4		2	1	
N _t	dB			
kbps)				
Control E_b (76.8		18		
N_{t}	dB			
kbps)				
\hat{I}_{or}/I_{oc}	dB	-infinity	0	
I_{oc}	dBm/1.22	-5	5	
1 oc	88 MHz	9	9	
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	
Propagation Condition		AW	GN	

A.5.3.3.2 Test Requirements

The UE shall start transmission of the reverse control channel in HRPD to Cell 2 less than 127 ms from the beginning of time period T2.

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

NOTE: The handover delay is expressed as: RRC procedure delay + T_{interrupt}, where:

T_{interrupt} also includes time to detect HRPD cell; see clause 5.4.1.1.2

This gives a total of 126.66 ms, allow 127 ms in the test case.

A.5.3.4 E-UTRAN FDD – cdma2000 1X Handover; Unknown Target cell

A.5.3.4.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to cdma2000 1X handover requirements for the case when the target cdma2000 1X cell is unknown as specified in clause 5.4.2.

The test parameters are given in Tables A.5.3.4.1-1, A.5.3.4.1-2 and A.5.3.4.1-3. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. During time period T1, message containing Information Element *systemTimeInfo* as defined in clause 6.3.1 of TS 36.331 [2] shall be sent by the System Simulator (SS). No gap patterns are configured in the test case. No cdma2000 1X neighbour cell list shall be provided to the UE.

A RRC message implying handover to the unknown cdma2000 1X cell shall be sent to the UE towards the end of the time period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.2.1-1: General test parameters for E-UTRAN FDD to cdma2000 1X handover test case; unknown target cdma2000 1X cell

Par	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement	As specified in clause A.3.1.1.1
-			Channel R.0 FDD	·
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidt	h (BW _{channel})	MHz	10	
DRX			OFF	Non-DRX test
Access Barring Inf	ormation	-	Not sent	No additional delays in random
				access procedure
E-UTRA RF Chan	nel Number		1	One E-UTRA FDD carrier
				frequency is used.
E-UTRA Channel	Bandwidth	MHz	10	
(BWchannel)				
cdma2000 1X RF Channel Number			1	One HRPD carrier frequency is
				used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in
				clause 6.3.5 in TS 36.331
T1		S	≤5	
T2	·	S	1	

Table A.5.3.2.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to unknown cdma2000 1X cell # 2

Parameter	Unit	Cell 1 (E-U	TRAN FDD)	
		T1	T2	
E-UTRA RF Channel number			1	
BW _{channel}	MHz	1	0	
OCNG Patterns defined in		OP.1	FDD	
A.3.2.1.1 (OP.1 FDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	0		
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG RA Note 1	dB			
OCNG_RB Note 1	dB			
$N_{oc}^{ m Note 2}$	dBm/15 kHz	-(98	
RSRP Note 3	dBm/15 kHz	-98	-98	
\hat{E}_s/N_{oc}	dB	0	0	
\hat{E}_s/I_{ot}	dB	0	0	
Propagation Condition		AW	GN	

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

 N_{oc} to be fulfilled.

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

Table A.5.3.2.1-3: Cell specific test parameters for unknown cdma2000 1X (cell # 2) for handover from E-UTRAN FDD cell (cell #1)

Parameter	Unit	Cell 2 (cdma2000 1X)			
		T1	T2		
Pilot E _c I _{or}	dB	-7			
Sync E _c	dB	-16			
$\frac{\text{Paging} \text{E}_{\text{c}}}{\text{I}_{\text{or}}} \text{(4.8 kbps)}$	dB	-12			
\hat{I}_{or}/I_{oc}	dB	-infinity 0			
I_{oc}	dBm/1.22 88 MHz	-55			
CDMA2000 1xRTT Pilot Strength	dB	-infinity -10			
Propagation Condition		AW	GN		

A.5.3.4.2 Test Requirements

The UE shall start transmission of the reverse control channel in cdma2000 1X to Cell 2 less than 300 ms from the beginning of time period T2.

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

NOTE: The handover delay is expressed as: RRC procedure delay + T_{interrupt}, where:

T_{interrupt} also includes time to detect cdma2000 1X cell; see clause 5.4.2.1.2

This gives a total of 300 ms.

A.5.3.5 E-UTRAN TDD - HRPD Handover

A.5.3.5.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD to HRPD handover requirements specified in clause 5.4.1.

The test parameters are given in Tables A.5.3.5.1-1, A.5.3.5.1-2 and A.5.3.5.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.5.1-1: General test parameters for E-UTRAN TDD to HRPD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Initial conditions Active			Cell 1	E-UTRAN TDD cell
	bouring cell		Cell 2	HRPD cell
Final condition Active			Cell 2	HRPD cell
Channel Bandwidth (BWch	nannel)	MHz	10	
Gap Pattern Id			0	As specified in Table 8.1.2.1-1 started before T2 starts
E-UTRAN TDD measurem			RSRP	
Inter-RAT (HRPD) measu	rement		CDMA2000 HRPD Pilot	
quantity			Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA200	0	dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Informatio	n	-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Num	ber		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwid (BWchannel)	dth	MHz	10	
Üplink-downlink configura	tion of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configur	ation of cell 1		6	As specified in table 4.2.1 in TS 36.211
HRPD RF Channel Number	er		1	One HRPD carrier frequency is used.
HRPD neighbour cell list s	ize		8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindow	/Size		8 (60 PN chips)	Search window size as defined in clause 6.3.5 in TS 36.331
T1		s	5	
T2		S	≤10	
T3		S	1	

Table A.5.3.5.1-2: Cell specific test parameters for E-UTRAN TDD cell#1 for handover to HRPD cell # 2

Parameter	Unit	С	ell 1 (E-UTR/	A)			
		T1	T2	T3			
E-UTRA RF Channel			1				
number							
BW _{channel}	MHz		10				
OCNG Patterns defined in		OP.1	TDD	OP.2			
TS36.133 A.3.2.2.1 (OP.1				TDD			
TDD) and in A.3.2.2.2							
(OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{ m Note~2}$	dBm/15		-98				
	kHz		T	T			
RSRP Note 3	dBm/15	-98	-98	-98			
	KHz						
\hat{E}_s/N_{oc}	dB	0	0	0			
\hat{E}_s/I_{ot}	dB	0	0	0			
Propagation Condition		AWGN					
constant total tran	nsmitted powe	er spectral de	nsity is achie	ved for all			
OFDM symbols.							
Note 2: Interference from test is assumed to							
be modelled as A	WGN of appr	opriate power	for N_{oc} to ${ m k}$	oe fulfilled.			
Note 3: RSRP levels have	RSRP levels have been derived from other parameters for						

Table A.5.3.5.1-3: Cell specific test parameters for HRPD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

information purposes. They are not settable parameters themselves.

Parameter	Unit	Cell 2 (HRPD)			
		T1	T2	T3	
$\frac{\text{Control} \text{E}_{\text{b}}}{\text{N}_{\text{t}}} \text{(38.4 kbps)}$	dB	21			
$\frac{\text{Control} \text{E}_{\text{b}}}{\text{N}_{\text{t}}} \text{ (76.8 kbps)}$	dB		18		
\hat{I}_{or}/I_{oc}	dB	-infinity	0	0	
I_{oc}	dBm/1.2288 MHz		-55		
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	-3	
Propagation Condition			AWGN		

A.5.3.5.2 Test Requirements

The UE shall start transmission of the reverse control channel in HRPD to Cell 2 less than 127 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 50 ms, which is specified in clause 5.4.1.1.1.

 $T_{interrupt} = 76.66 \text{ ms in the test; } T_{interrupt} \text{ is defined in clause 5.4.1.1.2.}$

This gives a total of 126.66 ms, allow 127 ms in the test.

A.5.3.6 E-UTRAN TDD – cdma2000 1X Handover

A.5.3.6.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD to cdma2000 1X handover requirements specified in clause 5.4.2.

The test parameters are given in Tables A.5.3.6.1-1, A.5.3.6.1-2 and A.5.3.6.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.6.1-1: General test parameters for E-UTRAN TDD to cdma2000 1X handover test case

Para	meter	Unit	Value	Comment
PDSCH parameters			Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PI	HICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Initial conditions	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth	(BW _{channel})	MHz	10	
Gap Pattern Id			0	As specified in Table 8.1.2.1-1 started before T2 starts
E-UTRAN TDD mea	asurement quantity		RSRP	
quantity	00 1X) measurement		CDMA2000 1xRTT Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDN	b2-Threshold2-CDMA2000		-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Info	rmation	-	Not sent	No additional delays in random access procedure
E-UTRA RF Chann	el Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel B (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One cdma2000 1X carrier frequency is used.
cdma2000 1X neighbour cell list size			8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-SearchV	VindowSize		8 (60 PN chips)	Search window size as defined in clause 6.3.5 in TS 36.331
T1		S	5	
T2		S	≤10	
T3		S	1	

Table A.5.3.6.1-2: Cell specific test parameters for E-UTRAN TDD cell#1 for handover to cdma2000 1X cell # 2

Parameter	Unit	Cell 1 (E-UTRA)		A)			
		T1	T2	Т3			
E-UTRA RF Channel			1				
number							
BW _{channel}	MHz		10				
OCNG Patterns defined in		OP.1	TDD	OP.2			
A.3.2.2.1 (OP.1 TDD) and				TDD			
in A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
N_{oc} Note 2	dBm/15		-98				
	kHz			00			
RSRP Note 3	dBm/15	-98	-98	-98			
	KHz			•			
\hat{E}_s/N_{oc}	dB	0	0	0			
\hat{E}_s/I_{ot}	dB	0	0	0			
Propagation Condition			AWGN				
Note 1: OCNG shall be us	ed such that	both cells are	fully allocate	ed and a			
constant total tran	constant total transmitted power spectral density is achieved for all						
OFDM symbols.							
Note 2: Interference from							
test is assumed to	be constant	over subcarri	ers and time	and shall			
	be modelled as AWGN of appropriate power for $^{N_{oc}}$ to be fulfilled.						
be modelled as A\	NGN of appro	priate power	for $\frac{\partial c}{\partial x}$ to b	be fulfilled.			
Note 3: RSRP levels have been derived from other parameters for							
information purposes. They are not settable parameters themselves.							

Table A.5.3.6.1-3: Cell specific test parameters for cdma2000 1X (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

Parameter	Unit	Cell	2 (cdma2000 1	X)	
		T1	T2	T3	
$\frac{\text{Pilot} \text{E}_{\text{c}}}{\text{I}_{\text{or}}}$	dB	-7			
$\frac{\mathrm{Sync} \ \mathrm{E_{c}}}{\mathrm{I}_{\mathrm{or}}}$	dB	-16			
$\frac{\text{Paging} \text{E}_{c}}{\text{I}_{\text{or}}} \text{(4.8 kbps)}$	dB	-12			
\hat{I}_{or}/I_{oc}	dB	-infinity 0 C			
I_{oc}	dBm/1.2288 MHz		-55		
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10	-10	
Propagation Condition		AWGN			

A.5.3.6.2 Test Requirements

The UE shall start transmission of the reverse control channel in cdma2000 1X to Cell 2 less than 300 ms from the beginning of time period T3.

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 130 ms, which is specified in clause 5.4.2.1.1.

 $T_{interrupt} = 170$ ms in the test; $T_{interrupt}$ is defined in clause 5.4.2.1.2.

This gives a total of 300 ms.

A.6 RRC Connection Control

A.6.1 RRC Re-establishment

A.6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment

A.6.1.1.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA FDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.1.2.

The test parameters are given in table A.6.1.1.1-1 and table A.6.1.1.1-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table A.6.1.1.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	nel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidtl	h (BW _{channel})	MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311	N311		1	Minimum consecutive in-sync indications from lower layers
T310	T310		0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX	DRX		OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		S	5	
T2		ms	200	
T3		S	3	

Table A.6.1.1.1-2: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Reestablishment test case

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD
defined in A.3.2.1.1		FDD	FDD	FDD			
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
\hat{E}_{s}/I_{ot}	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N _{oc} Note 2	dBm/15 KHz		·		-98	·	
\hat{E}_s/N_{oc}	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition					AWGN		

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

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

A.6.1.1.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the RRCConnectionReestablishmentRequest message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re-establish delay} = T_{UL grant} + T_{UE re-establish delay}$$

Where:

 $T_{UL_grant} = It$ is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{freq} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 $T_{SI} = 1280$ ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN FDD cell.

 T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, allow 1.5 s in the test case.

A.6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment

A.6.1.2.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA FDD inter-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.1.2.

The test parameters are given in table A.6.1.1.2-1 and table A.6.1.1.2-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of radio link failure. At the start of time period T3, cell 2, which is the neighbour cell, is activated.

Table A.6.1.2.1-1: General test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

	ımeter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	el Number (cell 1)		1	
E-UTRA RF Chann	el Number (cell 2)		2	
E-UTRA FDD inter-	frequency carrier list		1	2 E-UTRA FDD carrier
size				frequencies in total: 1 intra-
				frequency and 1 inter-frequency
Channel Bandwidth	(BW _{channel})	MHz	10	
N310	,	-	1	Maximum consecutive out-of-sync
				indications from lower layers
N311		-	1	Minimum consecutive in-sync
				indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset betwee	n cells	ms	3	Asynchronous cells
T1		S	5	
T2		ms	200	
T3		S	5	

Table A.6.1.2.1-2: Cell specific test parameters for E-UTRAN FDD inter-frequency RRC Reestablishment test case

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1			2		
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD	
defined in A.3.2.1.1		FDD	FDD	FDD				
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB		•			•		
PDCCH_RA	dB		0			0		
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7	
N_{oc} Note 2	dBm/15 KHz				-98			
\hat{E}_s/N_{oc}	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	7	
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91	
Propagation Condition					AWGN			

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

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

A.6.1.2.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the RRCConnectionReestablishmentRequest message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA FDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re-establish delay} = T_{UL grant} + T_{UE re-establish delay}$$

Where:

 $T_{UL_grant} = It$ is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{\text{freq}} = 2$$

$$T_{\text{search}} = 800 \text{ ms}$$

 $T_{SI} = 1280$ ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN FDD cell.

 T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, allow 3 s in the test case.

A.6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment

A.6.1.3.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA TDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.1.2.

The test parameters are given in table A.6.1.3.1-1 and table A.6.1.3.1-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table A.6.1.3.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Pai	rameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/	PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chan	nel Number		1	Only one TDD carrier frequency is used.
Channel Bandwid	th (BW _{channel})	MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring In	formation	-	Not Sent	No additional delays in random access procedure.
Special subframe	configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink co	onfiguration		1	As specified in table 4.2-2 in TS 36.211
PRACH configura	tion index		53	As specified in table 5.7.1-3 in TS 36.211
Time offset betwe	en cells	μs	3	Synchronous cells
T1		S	5	
T2		ms	200	
T3		S	3	

Table A.6.1.3.1-2: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Reestablishment test case

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 TDD	OP.2 TDD	OP.1 TDD
defined in A.3.2.2.1		TDD	TDD	TDD			
(OP.1 TDD) and in							
A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB					•	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
\hat{E}_{s}/I_{ot}	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N _{oc} Note 2	dBm/15 KHz		·		-98	·	
\hat{E}_s/N_{oc}	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition					AWGN		

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

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

A.6.1.3.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the RRCConnectionReestablishmentRequest message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re-establish delay} = T_{UL grant} + T_{UE re-establish delay}$$

Where:

 $T_{UL_grant} = It$ is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{freq} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 $T_{SI} = 1280$ ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN TDD cell.

 T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, allow 1.5 s in the test case.

A.6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment

A.6.1.4.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA TDD inter-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.1.2.

The test parameters are given in table A.6.1.4.1-1 and table A.6.1.4.1-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of radio link failure. At the start of time period T3, cell 2, which is the neighbour cell, is activated.

Table A.6.1.4.1-1: General test parameters for E-UTRAN TDD inter-frequency RRC Re-establishment test case

Para	ameter	Unit	Value	Comment
PDSCH parameter	S		DL Reference Measurement	As specified in clause A.3.1.1.2
			Channel R.0 TDD	
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.2
	•		Channel R.6 TDD	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	el Number (cell 1)		1	
E-UTRA RF Chann	` ,		2	
	-frequency carrier list		2	2 E-UTRA TDD carrier
size	, ,			frequencies in total: 1 intra-
				frequency and 1 inter-frequency
Channel Bandwidth	n (BW _{channel})	MHz	10	
N310		-	1	Maximum consecutive out-of-sync
				indications from lower layers
N311		-	1	Minimum consecutive in-sync
				indications from lower layers
T310		ms	0	Radio link failure timer; T310 is
				disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random
· ·				access procedure.
Special subframe of	onfiguration		6	As specified in table 4.2-1 in TS
•	•			36.211
Uplink-downlink co	nfiguration		1	As specified in table 4.2-2 in TS
•	J			36.211
PRACH configurati	on index		53	As specified in table 5.7.1-3 in TS
J				36.211
Time offset betwee	n cells	μs	3	Synchronous cells
T1		S	5	
T2		ms	200	
T3		S	5	

Table A.6.1.4.1-2: Cell specific test parameters for E-UTRAN TDD inter-frequency RRC Reestablishment test case

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1			2		
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 TDD	OP.2 TDD	OP.1 TDD	
defined in A.3.2.2.1		TDD	TDD	TDD				
(OP.1 TDD) and in								
A.3.2.2.2 (OP.2 TDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB		•			•		
PDCCH_RA	dB		0			0		
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7	
N_{oc} Note 2	dBm/15 KHz				-98		·	
\hat{E}_s/N_{oc}	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	7	
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91	
Propagation Condition					AWGN			

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

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

A.6.1.4.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the RRCConnectionReestablishmentRequest message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA TDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re-establish delay} = T_{UL grant} + T_{UE re-establish delay}$$

Where:

 $T_{UL_grant} = It$ is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{\text{freq}} = 2$$

$$T_{\text{search}} = 800 \text{ ms}$$

 $T_{SI} = 1280$ ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN TDD cell.

 $T_{PRACH} = 15$ ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, allow 3 s in the test case.

A.6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz bandwidth

A.6.1.5.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.6.1.1.1.

The parameters of this test are the same as defined in Subclause A.6.1.1.1 except that the values of the parameters in the Table A.6.1.5.1-1 will replace the values of the corresponding parameters in A.6.1.1.1-1, and the values of the parameters in the Table A.6.1.5.1-2 will replace the values of the corresponding parameters in A.6.1.1.1-2.

Table A.6.1.5.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case for 5MHz bandwidth

Parameter	Unit	Value	Comment			
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.3.1.1.1			
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.3.1.2.1			
Channel Bandwidth (BW _{channel})	MHz	5				
Note 1: See Table A.6.1.1.1-1 for the other parameters.						
Note 2: This test is according to the principle defined in section A.3.7.2.						

Table A.6.1.5.1-2: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Reestablishment test case for 5MHz bandwidth

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
BW _{channel}	MHz		5			5	
OCNG Patterns defined in A.3.2.1.15 (OP.15 FDD) and A.3.2.1.16 (OP.16 FDD)		OP.15 FDD	OP.15 FDD	OP.16 FDD	OP.16 FDD	OP.16 FDD	OP.15 FDD
	Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral						

density is achieved for all OFDM symbols.

Note 2: See Table A.6.1.5.1-2 for the other parameters.

A.6.1.5.2 Test Requirements

The test requirements defined in section A.6.1.1.2 shall apply to this test case.

A.6.1.6 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for UE category 0

A.6.1.6.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA FDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.1.2.

The test parameters are given in table A.6.1.6.1-1 and table A.6.1.6.1-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table A.6.1.6.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH paramete	ers		DL Reference Measurement Channel R.13 FDD	As specified in clause A.3.1.1.3
PCFICH/PDCCH/	PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chan	inel Number		1	Only one FDD carrier frequency is used.
Channel Bandwid	th (BW _{channel})	MHz	10	
N310	·		1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring In	formation	-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset betwe	en cells	ms	3	Asynchronous cells
T1		S	5	
T2		ms	200	
T3		S	3	

Table A.6.1.6.1-2: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Reestablishment test case

Parameter	Unit		Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1		1			
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD	
defined in A.3.2.1.1		FDD	FDD	FDD				
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB		0			0		
PDCCH_RA	dB		0			0		
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
\hat{E}_{s}/I_{ot}	dB	1.54	-Infinity	-Infinity	-3.79	4	4	
$N_{oc}^{ m Note 2}$	dBm/15 KHz	-98						
\hat{E}_s/N_{oc}	dB	7	-Infinity	-Infinity	4	4	4	
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94	
Propagation Condition			•		AWGN	•	•	
Note 1: OCNG shall b	e used such that	both cells a	re fully alloca	ated and a co	onstant total tra	ansmitted powe	er spectral	

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

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

A.6.1.6.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the RRCConnectionReestablishmentRequest message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re-establish delay} = T_{UL grant} + T_{UE re-establish delay}$$
.

Where:

 T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{freq} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN FDD cell.

 T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, allow 1.5 s in the test case.

A.6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0

A.6.1.7.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA FDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.1.2.

The test parameters are given in table A.6.1.7.1-1 and table A.6.1.7.1-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table A.6.1.7.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency RRC Reestablishment test case

Para	ameter	Unit	Value	Comment
PDSCH parameter	S		DL Reference Measurement	As specified in clause A.3.1.1.4
			Channel R.1 HD-FDD	·
PCFICH/PDCCH/P	PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.3
			Channel R.3 HD-FDD	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	nel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth	n (BW _{channel})	MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset betwee	en cells	ms	3	Asynchronous cells
T1		S	5	
T2		ms	200	
T3		S	3	

Table A.6.1.7.1-2: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency RRC Reestablishment test case

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1			1		
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD	
defined in A.3.2.1.1		FDD	FDD	FDD				
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB		_			_		
PDCCH_RA	dB		0			0		
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
\hat{E}_s/I_{ot}	dB	1.54	-Infinity	-Infinity	-3.79	4	4	
$N_{oc}^{ m Note2}$	dBm/15 KHz				-98			
\hat{E}_s/N_{oc}	dB	7	-Infinity	-Infinity	4	4	4	
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94	
Propagation Condition		AWGN						
	e used such that		re fully alloca	ated and a co	onstant total tra	ansmitted powe	er spectral	

density is achieved for all OFDM symbols.

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

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

A.6.1.7.2 **Test Requirements**

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the RRCConnectionReestablishmentRequest message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

The RRC re-establishment delay in the test is derived from the following expression:

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{freq} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN FDD cell.

 T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, allow 1.5 s in the test case.

A.6.1.8 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0

A.6.1.8.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA TDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.1.2.

The test parameters are given in table A.6.1.8.1-1 and table A.6.1.8.1-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table A.6.1.8.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.12 TDD	As specified in clause A.3.1.1.5
PCFICH/PDCCH/I	PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.2
			Channel R.6 TDD	·
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chan	nel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidt	th (BW _{channel})	MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Inf	formation	-	Not Sent	No additional delays in random access procedure.
Special subframe	configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink co	onfiguration		1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between	en cells	μs	3	Synchronous cells
T1		s	5	
T2		ms	200	
T3		S	3	

Table A.6.1.8.1-2: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Reestablishment test case

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 TDD	OP.2 TDD	OP.1 TDD
defined in A.3.2.2.1		TDD	TDD	TDD			
(OP.1 TDD) and in							
A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		_			_	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
\hat{E}_{s}/I_{ot}	dB	1.54	-Infinity	-Infinity	-3.79	4	4
$N_{oc}^{$	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					
Note 1: OCNG shall b	e used such that	both cells a	re fully alloca	ated and a c	onstant total tra	ansmitted power	er spectral
density is achieved for all OFDM symbols							

density is achieved for all OFDM symbols.

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

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

A.6.1.8.2 **Test Requirements**

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the RRCConnectionReestablishmentRequest message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re-establish delay} = T_{UL grant} + T_{UE re-establish delay}$$
.

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{freq} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 $T_{SI} = 1280$ ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN TDD cell.

 T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, allow 1.5 s in the test case.

A.6.2 Random Access

A.6.2.1 E-UTRAN FDD – Contention Based Random Access Test

A.6.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the behavior of the random access procedure is according to the requirements and that the PRACH power settings and timing are within specified limits. This test will verify the requirements in Clause 6.2.2 and Clause 7.1.2 in an AWGN model.

For this test a single cell is used. The test parameters are given in tables A.6.2.1.1-1 and A.6.2.1.1-2.

Table A.6.2.1.1-1: General test parameters for FDD contention based random access test

Parameter	Unit	Value	Comments			
E-UTRA RF Channel Number		1				
BW _{channel}	MHz	10				
OCNG Pattern Note 1		OP.1/2 FDD Note 1	As defined in A.3.2.1.1/2.			
PDSCH parameters Note 4		DL Reference Measurement	As defined in A.3.1.1.1.			
		Channel R.0 FDD Note 4				
PCFICH/PDCCH/PHICH		DL Reference Measurement	As defined in A.3.1.2.1.			
parameters		Channel R.6 FDD				
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	3				
N_{oc}	dBm/15 KHz	-98				
\hat{E}_s/N_{oc}	dB	3				
lo Note 2	dBm/9 MHz	-65.5				
RSRP Note 3	dBm/15 KHz	-95				
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in TS 36.331.			
Configured UE transmitted	dBm	23	As defined in clause 6.2.5			
power ($P_{ m CMAX}$)			in TS 36.101.			
PRACH Configuration Index	-	4	As defined in table 5.7.1-2 in TS 36.211.			
Backoff Parameter Index	-	2	As defined in table 7.2-1 in TS 36.321.			
Propagation Condition	-	AWGN				
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test						

according to the presence of a DL reference measurement channel.

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Note 4: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the UE under test is required.

Table A.6.2.1.1-2: RACH-Configuration parameters for FDD contention based random access test

Field	Value	Comment			
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
ra-ResponseWindowSize	sf10	10 sub-frames			
mac-ContentionResolutionTimer	sf48	48 sub-frames			
maxHARQ-Msg3Tx	4				
Note: For further information see Clause 6.3.2 in TS 36.331					

A.6.2.1.2 Test Requirements

Contention based random access is triggered by *not* explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.1.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.1.1 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

The UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm. The power of the first preamble shall be -30 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.1.2.2 No Random Access Response Reception

To test the UE behavior specified in subclause 6.2.2.1.2 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. The System Simulator shall *not* respond to the first 4 preambles.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no Random Access Response is received within the RA Response window.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.1.2.3 Receiving a NACK on msg3

To test the UE behavior specified in subclause 6.2.2.1.3 the System Simulator shall NACK *all* UE msg3 following a successful Random Access Response.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ re-transmissions is reached.

A.6.2.1.2.4 Reception of an Incorrect Message over Temporary C-RNTI

To test the UE behavior specified in Subclause 6.2.2.1.5 the System Simulator shall send a message addressed to the temporary C-RNTI with a UE Contention Resolution Identity included in the MAC control element *not* matching the CCCH SDU transmitted in msg3 uplink message.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

A.6.2.1.2.5 Reception of a Correct Message over Temporary C-RNTI

To test the UE behavior specified in Subclause 6.2.2.1.5 the System Simulator shall send a message addressed to the temporary C-RNTI with a UE Contention Resolution Identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

The UE shall send ACK if the Contention Resolution is successful.

A.6.2.1.2.6 Contention Resolution Timer expiry

To test the UE behavior specified in Subclause 6.2.2.1.6 the System Simulator shall *not* send a response to a msg3.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if the Contention Resolution Timer expires.

A.6.2.2 E-UTRAN FDD – Non-Contention Based Random Access Test

A.6.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the behavior of the random access procedure is according to the requirements and that the PRACH power settings and timing are within specified limits. This test will verify the requirements in Clause 6.2.2 and Clause 7.1.2 in an AWGN model.

For this test a single cell is used. The test parameters are given in tables A.6.2.2.1-1 and A.6.2.2.1-2.

Table A.6.2.2.1-1: General test parameters for FDD non-contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
BW _{channel}	MHz	10	
OCNG Pattern		OP.1 FDD	As defined in A.3.2.1.1.
PDSCH parameters		DL Reference Measurement	As defined in A.3.1.1.1.
		Channel R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As defined in A.3.1.2.1.
parameters		Channel R.6 FDD	
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
\hat{E}_{s}/I_{ot}	dB	3	
N_{oc}	dBm/15 KHz	-98	
\hat{E}_s/N_{oc}	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in TS 36.331.
Configured UE transmitted	dBm	23	As defined in clause 6.2.5
power ($P_{ m CMAX}$)			in TS 36.101.
PRACH Configuration Index	-	4	As defined in table 5.7.1-2
De alcoff Davage atom lands:		2	in TS 36.211.
Backoff Parameter Index	-	2	As defined in table 7.2-1 in TS 36.321.
Propagation Condition		AWGN	

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

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable

Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table A.6.2.2.1-2: RACH-Configuration parameters for FDD non-contention based random access test

Field	Value	Comment	
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
preambleTransMax	n6		
ra-ResponseWindowSize sf10 10 sub-frames			
Note: For further information see Clause 6.3.2 in TS 36.331.			

A.6.2.2.2 Test Requirements

Non-Contention based random access is triggered by explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.2.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.2.1 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.2.2.2 No Random Access Response Reception

To test the UE behavior specified in subclause 6.2.2.2.2 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. The System Simulator shall *not* respond to the first 4 preambles.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.3 E-UTRAN TDD – Contention Based Random Access Test

A.6.2.3.1 Test Purpose and Environment

The purpose of this test is to verify that the behavior of the random access procedure is according to the requirements and that the PRACH power settings and timing are within specified limits. This test will verify the requirements in Clause 6.2.2 and Clause 7.1.2 in an AWGN model.

For this test a single cell is used. The test parameters are given in tables A.6.2.3.1-1 and A.6.2.3.1-2.

Table A.6.2.3.1-1: General test parameters for TDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number	-	1	
BW	MHz	10	
OCNG Pattern Note 1	-	OP.1/2 TDD Note 1	As defined in A.3.2.2.1/2.
PDSCH parameters Note 4	-	DL Reference Measurement Channel R.0 TDD Note 4	As defined in A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters	-	DL Reference Measurement Channel R.6 TDD	As defined in A.3.1.2.2.
Special subframe configuration	-	6	As specified in table 4.2-1 in TS 36.211.
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in TS 36.211.
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
\hat{E}_{s}/I_{ot}	dB	3	
N_{oc}	dBm/15 KHz	-98	
\hat{E}_s/N_{oc}	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in TS 36.331.
Configured UE transmitted	dBm	23	As defined in clause 6.2.5
power ($P_{ m CMAX}$)			in TS 36.101.
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in TS 36.211.
Backoff Parameter Index	-	2	As defined in table 7.2-1 in TS 36.321.
Propagation Condition	-	AWGN	
N	1 (1 (4)		

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Note 4: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the UE under test is required.

Table A.6.2.3.1-2: RACH-Configuration parameters for TDD contention based random access test

Field	Value	Comment		
numberOfRA-Preambles	n52			
sizeOfRA-PreamblesGroupA	n52	No group B.		
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax	n6			
ra-ResponseWindowSize	sf10	10 sub-frames		
mac-ContentionResolutionTimer	sf48	48 sub-frames		
maxHARQ-Msg3Tx	4			
Note: For further information see Clause 6.3.2 in TS 36.331.				

A.6.2.3.2 Test Requirements

Contention based random access is triggered by *not* explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.3.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.1.1 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

The UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -22 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.3.2.2 No Random Access Response reception

To test the UE behavior specified in Subclause 6.2.2.1.2 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. The System Simulator shall *not* respond to the first 4 preambles.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no Random Access Response is received within the RA Response window.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -22 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.3.2.3 Receiving a NACK on msg3

To test the UE behavior specified in Subclause 6.2.2.1.3 the System Simulator shall NACK *all* UE msg3 following a successful Random Access Response.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ re-transmissions is reached.

A.6.2.3.2.4 Reception of an Incorrect Message over Temporary C-RNTI

To test the UE behavior specified in Subclause 6.2.2.1.5 the System Simulator shall send a message addressed to the temporary C-RNTI with a UE Contention Resolution Identity included in the MAC control element *not* matching the CCCH SDU transmitted in msg3 uplink message.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

A.6.2.3.2.5 Reception of a Correct Message over Temporary C-RNTI

To test the UE behavior specified in Subclause 6.2.2.1.5 the System Simulator shall send a message addressed to the temporary C-RNTI with a UE Contention Resolution Identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

The UE shall send ACK if the Contention Resolution is successful.

A.6.2.3.2.6 Contention Resolution Timer expiry

To test the UE behavior specified in Subclause 6.2.2.1.6 the System Simulator shall not send a response to a msg3.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if the Contention Resolution Timer expires.

A.6.2.4 E-UTRAN TDD - Non-Contention Based Random Access Test

A.6.2.4.1 Test Purpose and Environment

The purpose of this test is to verify that the behavior of the random access procedure is according to the requirements and that the PRACH power settings and timing are within specified limits. This test will verify the requirements in Clause 6.2.2 and Clause 7.1.2 in an AWGN model.

For this test a single cell is used. The test parameters are given in tables A.6.2.4.1-1 and A.6.2.4.1-2.

Table A.6.2.4.1-1: General test parameters for TDD non-contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number	-	1	
BW _{channel}	MHz	10	
OCNG Pattern	-	OP.1 TDD	As defined in A.3.2.2.1.
PDSCH parameters	-	DL Reference Measurement	As defined in A.3.1.1.2.
·		Channel R.0 TDD	
PCFICH/PDCCH/PHICH	-	DL Reference Measurement	As defined in A.3.1.2.2.
parameters		Channel R.6 TDD	
Special subframe	-	6	As specified in table 4.2-1
configuration			in TS 36.211.
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in TS 36.211.
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_{_{\mathrm{s}}}/I_{_{\mathrm{ot}}}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
\hat{E}_s/N_{oc}	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in TS 36.331.
Configured UE transmitted	dBm	23	As defined in clause 6.2.5
power ($P_{ m CMAX}$)			in TS 36.101.
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in TS 36.211.
Backoff Parameter Index	-	2	As defined in table 7.2-1 in TS 36.321.
Propagation Condition	-	AWGN	
Note 1: OCNC shall be used as	: 11	o fully allocated and a constant	total transmitted in accord

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

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table A.6.2.4.1-2: RACH-Configuration parameters for TDD non-contention based random access test

Field	Value	Comment	
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
preambleTransMax	n6		
ra-ResponseWindowSize sf10 10 sub-frames			
Note: For further information see Clause 6.3.2 in TS 36.331.			

A.6.2.4.2 Test Requirements

Non-Contention based random access is triggered by explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.4.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.2.1 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -22 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.4.2.2 No Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.2.2 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. The System Simulator shall *not* respond to the first 4 preambles.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -22 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.5 E-UTRAN FDD – Contention Based Random Access Test for 5MHz bandwidth

A.6.2.5.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.6.2.1.1.

The parameters of this test are the same as defined in Subclause A.6.2.1.1 except that the values of the parameters in the Table A.6.2.5.1-1 will replace the values of the corresponding parameters in A.6.2.1.1-1

Table A.6.2.5.1-1: General test parameters for FDD contention based random access test for 5MHz bandwidth

	Parameter	Unit	Value	Comments	
BW _{channel}		MHz	5		
OCNG Pa	attern ^{Note 1}		OP.15/16 FDD Note 1	As defined in	
				A.3.2.1.15/16.	
PDSCH p	parameters Note 2		DL Reference Measurement Channel R.5 FDD Note 2	As defined in A.3.1.1.1.	
PCFICH/	PDCCH/PHICH		DL Reference Measurement	As defined in A.3.1.2.1.	
paramete	ers		Channel R.11 FDD		
lo Note 2		dBm/4.5	-68.5		
10		MHz			
Note 1:	Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power				
			FDM symbols. The OCNG patte	rn is chosen during the test	
	according to the presence of a DL reference measurement channel.				
Note 2:					
	transmission dedicated to the UE under test is required.				
Note 3:	Note 3: See Table A.6.2.1.1-1 for the other parameters.				
Note 4: This test is according to the principle defined in section A.3.7.2.					

A.6.2.5.2 Test Requirements

The test requirements defined in section A.6.2.1.2 shall apply to this test case.

A.6.2.6 E-UTRAN FDD – Non-contention Based Random Access Test for 5MHz bandwidth

A.6.2.6.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.6.2.2.1.

The parameters of this test are the same as defined in Subclause A.6.2.2.1except that the values of the parameters in the Table A.6.2.6.1-1 will replace the values of the corresponding parameters in A.6.2.2.1-1

Table A.6.2.6.1-1: General test parameters for FDD non-contention based random access test for 5MHz bandwidth

Parameter	Unit	Value	Comments	
BW _{channel}	MHz	5		
OCNG Pattern Note 1		OP.15 FDD Note 1	As defined in A.3.2.1.15.	
PDSCH parameters Note 2		DL Reference Measurement Channel R.5 FDD Note 2	As defined in A.3.1.1.1.	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As defined in A.3.1.2.1.	
lo Note 2	dBm/4.5 MHz	-68.5		
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				
Note 2: Io level has been de parameter				
Note 3: See Table A.6.2.2.1	ote 3: See Table A.6.2.2.1-1 for the other parameters.			
Note 4: This test is according	g to the principle	defined in section A.3.7.2.		

A.6.2.6.2 Test Requirements

The test requirements defined in section A.6.2.2.2 shall apply to this test case.

A.6.2.7 E-UTRAN FDD – Non-Contention Based Random Access Test For SCell

A.6.2.7.1 Test Purpose and Environment

The purpose of this test is to verify that the behavior of the random access procedure, for the SCell, is according to the requirements and that the PRACH power settings and timing, for the SCell, are within specified limits. This test will verify the requirements in Clause 6.2.2 and Clause 7.1.2 in an AWGN model.

For this test two cells are used. Cell 1 is PCell and Cell 2 is SCell. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG). The purpose of the PCell is to allow the SCell to be configured and to handle the Random Access Response which takes place on PCell. The test parameters are given in tables A.6.2.7.1-1 and A.6.2.7.1-2.

Table A.6.2.7.1-1: General test parameters for FDD non-contention based random access test

Parameter	Unit	Cell 1	Cell 2	Comments
E-UTRA RF Channel Number		1	2	
BW _{channel}	MHz	10	10	
Active PCell		Cell 1		Primary cell of RF
				channel number 1.
Active SCell			Cell 2	Secondary cell of RF
				channel number 2.
TAG configuration		pTAG	sTAG	pTAG+sTAG
		·		configures Cell 1 and
				Cell 2 to separate
				TAGs
OCNG Pattern		OP.1 FDD	OP.1 FDD	As defined in
				A.3.2.1.11.
PDSCH parameters		DL Reference	DL Reference	As defined in A.3.1.1.1.
		Measurement Channel	Measurement	
		R.0 FDD	Channel R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference	DL Reference	As defined in A.3.1.2.1.
parameters		Measurement Channel	Measurement	
		R.6 FDD	Channel R.6 FDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB		•	
PHICH_RB	dB	0	0	
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
\hat{E}_{s}/I_{ot}	dB	3	3	
	dBm/15 KHz	-98	-98	
N_{oc}			-90	
\hat{E}_s/N_{oc}	dB	3	3	
lo Note 2	dBm/9 MHz	-65.5	-65.5	
RSRP Note 3	dBm/15 KHz	-95	-95	
reference Cianal Device	dBm/15 KHz	-5	-5	As defined in clause
referenceSignalPower				6.3.2 in TS 36.331.
Configured UE transmitted	dBm	23	23	As defined in clause
power ($P_{ m CMAX,c}$)				6.2.5 in TS 36.101.
PRACH Configuration Index	_	4	4	As defined in table
FRACE Configuration index	_	4	4	5.7.1-2 in TS 36.211.
Backoff Parameter Index		2	2	•
Dackui Falametel muex	-		2	As defined in table 7.2-1 in TS 36.321.
Propagation Condition	_	AWGN	AWGN	1 111 10 00.021.
Note 4: OONO de all le avec de		AVVGIN	AVVGIN	1

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

lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 2:

RSRP level has been derived from other parameters for information purposes. It is not a settable parameter. Note 3:

Table A.6.2.7.1-2: RACH-Configuration parameters for FDD non-contention based random access test

Field	Value	Comment		
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax	n6			
ra-ResponseWindowSize	sf10	10 sub-frames		
Note: For further information see Clause 6.3.2 in TS 36.331.				

A.6.2.7.2 Test Requirements

Non-Contention based random access is triggered by explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.7.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.2.1 the System Simulator shall transmit, on Cell 1, the PCell, a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator, on Cell 2. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.7.2.2 No Random Access Response Reception

To test the UE behavior specified in subclause 6.2.2.2.2 the System Simulator shall transmit, on Cell 1, the PCell, a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator on Cell 2. The System Simulator shall *not* respond to the first 4 preambles.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.7.2.3 Stop Preamble transmission if maximum number of preamble transmission counter has been reached

To test the UE behavior specified in Subclause 6.2.2 the System Simulator shall transmit, in response to the first 6 preambles, a Random Access Response *not* corresponding to the transmitted Random Access Preamble on Cell 1, the PCell. The UE shall stop transmitting preambles after 6 preambles.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.8 E-UTRAN TDD – Non-Contention Based Random Access Test For SCell

A.6.2.8.1 Test Purpose and Environment

This test is applicable for UE supporting the optional capability of Multiple Timing Advance.

The purpose of this test is to verify that the behavior of the random access procedure, for the SCell, is according to the requirements and that the PRACH power settings and timing, for the SCell, are within specified limits. This test will verify the requirements in Clause 6.2.2 and Clause 7.1.2 in an AWGN model.

For this test two cells are used. Cell 1 is PCell and Cell 2 is SCell. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG). The purpose of the PCell is to allow the SCell to be configured and to handle the Random Access Response which takes place on PCell. The test parameters are given in tables A.6.2.8.1-1 and A.6.2.8.1-2.

Table A.6.2.8.1-1: General test parameters for TDD non-contention based random access test

Parameter	Unit	Cell 1	Cell 2	Comments
E-UTRA RF Channel Number	-	1	1	
BW _{channel}	MHz	10	10	
Active PCell		Cell 1		Primary cell of RF
		Cell 1		channel number 1.
Active SCell			0-110	Secondary cell of RF
			Cell 2	channel number 2.
TAG configuration		pTAG	sTAG	pTAG+sTAG
G		•		configures Cell 1 and
				Cell 2 to separate
				TAGs
OCNG Pattern	-	OP.1 TDD	OP.1 TDD	As defined in
				A.3.2.2.1.
PDSCH parameters	-	DL Reference	DL Reference	As defined in
·		Measurement	Measurement	A.3.1.1.2.
		Channel R.0 TDD	Channel R.0 TDD	
PCFICH/PDCCH/PHICH	-	DL Reference	DL Reference	As defined in
parameters		Measurement	Measurement	A.3.1.2.2.
•		Channel R.6 TDD	Channel R.6 TDD	
Special subframe	-	6	6	As specified in table
configuration				4.2-1 in TS 36.211.
Uplink-downlink configuration	-	1	1	As specified in table
				4.2-2 in TS 36.211.
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	0	0	
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
	dB	3	3	
${ m \hat{E}}_{ m s}/{ m I}_{ m ot}$	u u u	· ·		
	dBm/15 KHz	-98	-98	
N_{oc}				
\hat{E}_s/N_{oc}	dB	3	3	
lo Note 2	15 (0.14)	0.5.5	05.5	
RSRP Note 3	dBm/9 MHz	-65.5	-65.5	
RSRP	dBm/15 KHz	-95	-95	1.6
referenceSignalPower	dBm/15 KHz	-5	-5	As defined in clause 6.3.2 in TS 36.331.
Configured UE transmitted	dBm	23	23	As defined in clause
power ($P_{ m CMAX,c}$)				6.2.5 in TS 36.101.
PRACH Configuration Index	-	53	53	As defined in table
-				5.7.1-3 in TS 36.211.
Backoff Parameter Index	-	2	2	As defined in table
				7.2-1 in TS 36.321.
Propagation Condition	-	AWGN	AWGN	
Note 1. OCNC shall be used	ll- tlt tl			-l

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

Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 2:

RSRP level has been derived from other parameters for information purposes. It is not a settable parameter. Note 3:

Table A.6.2.8.1-2: RACH-Configuration parameters for TDD non-contention based random access test

Field	Value	Comment		
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax	n6			
ra-ResponseWindowSize	sf10	10 sub-frames		
Note: For further information see Clause 6.3.2 in TS 36.331.				

A.6.2.8.2 Test Requirements

Non-Contention based random access is triggered by explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.8.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.2.1 the System Simulator shall transmit, on Cell 1, the PCell, a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator, on Cell 2. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -22 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.8.2.2 No Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.2.2 the System Simulator shall transmit, on Cell 1, the PCell, a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator, on Cell 2. The System Simulator shall *not* respond to the first 4 preambles.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -22 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.8.2.3 Stop Preamble transmission if maximum number of preamble transmission counter has been reached

To test the UE behavior specified in Subclause 6.2.2 the System Simulator shall transmit, in response to the first 6 preambles, a Random Access Response *not* corresponding to the transmitted Random Access Preamble on Cell 1, the PCell. The UE shall stop transmitting preambles after 6 preambles.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -22 dBm with an accuracy specified in clause 6.3.5.1.1 of TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in clause 6.3.5.2.1 of TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.3 RRC Connection Release with Redirection

A.6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD

A.6.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct performing the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in clause 6.3.2.1.

The test parameters are given in Tables A.6.3.1.1-1, A.6.3.1.1-2 and A.6.3.1.1-3 below. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "RRCConnectionRelease" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the UE shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

Table A.6.3.1.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN FDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the " <i>RRCConnectionRelease</i> " message from the E-UTRAN
T1	S	≤5	
T2	S	1	

Table A.6.3.1.1-2: Cell specific test parameters for cell #1 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell	1		
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
OCNG Pattern defined in					
A.3.2.1.1 (OP.1 FDD)		OP.1 I	FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4		
$N_{oc}^{$	dBm/15 kHz	-98	3		
\hat{E}_s/N_{oc}	dB	4	4		
RSRP Note 4	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWGN			
Note 1: OCNG shall be used		l is fully allocated and a constant	t total transmitted power		

spectral density is achieved for all OFDM symbols.

The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 2:

Interference from other cells and noise sources not specified in the test is assumed to be constant Note 3: over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{
m oc}$ to be

RSRP levels have been derived from other parameters for information purposes. They are not Note 4: settable parameters themselves.

Table A.6.3.1.1-3: Cell specific test parameters for cell #2 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 2			
		T1	T1		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.941			
\hat{I}_{or}/I_{oc}	dB	- 00	0.02		
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/Io ^{Note 3}	dB	-∞ -13			
Propagation Condition		AWGN			

Note 1: The DPCH level is controlled by the power control loop.

The power of the OCNS channel that is added shall make the total power from the cell to be equal Note 2: to Ior.

This gives an SCH Ec/lo of -15dB Note 3:

A.6.3.1.2 Test Requirements

The UE shall start to transmit random access to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRAN FDD observed during repeated tests shall be at least 90%.

NOTE: The Re-establishment delay in this case can be expressed as

$$T_{connection_release_redirect_UTRA\;FDD} = T_{RRC_procedure_delay} + T_{identify_UTRA\;FDD} + T_{SI_UTRA\;FDD} + T_{RA}$$

where

 $T_{RRC_procedure_delay} = 110 \text{ ms}$

 $T_{identify-UTRA\ FDD} = 500\ ms$

 $T_{SI-UTRA\ FDD}$ = the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 0 ms is assumed in this test case.

 T_{RA} = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 650 ms.

A.6.3.2 Redirection from E-UTRAN TDD to UTRAN FDD

A.6.3.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct performing the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in clause 6.3.2.1.

The test parameters are given in Tables A.6.3.2.1-1, A.6.3.2.1-2 and A.6.3.2.1-3 below. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "RRCConnectionRelease" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the UE shall not have any timing information of cell 2. Cell 2 is powered up at the beginning of the T2,

Table A.6.3.2.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN TDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement	As specified in clause A.3.1.1.2.
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.2.
(E-UTRAN TDD)		Channel R.6 TDD	
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		16	UTRA cells on UTRA RF channel 1 provided
			in the "RRCConnectionRelease" message
			from the E-UTRAN
T1	S	≤5	
T2	S	1	

Table A.6.3.2.1-2: Cell specific test parameters for cell #1 E-UTRAN TDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell	1		
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
OCNG Pattern defined in					
A.3.2.2.1 (OP.1 TDD)		OP.1 ⁻	TDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4		
$N_{oc}^{ m Note~3}$	dBm/15 kHz	-98	3		
\hat{E}_s/N_{oc}	dB	4	4		
RSRP Note 4	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWGN			
Note 1: OCNG shall be used		l is fully allocated and a constant	t total transmitted power		

spectral density is achieved for all OFDM symbols.

The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 2:

Interference from other cells and noise sources not specified in the test is assumed to be constant Note 3: over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{
m oc}$ to be

RSRP levels have been derived from other parameters for information purposes. They are not Note 4: settable parameters themselves.

Table A.6.3.2.1-3: Cell specific test parameters for cell #2 E-UTRAN TDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 2			
		T1	T2		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.941			
\hat{I}_{or}/I_{oc}	dB	- 00	0.02		
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/Io ^{Note 3}	dB	-∞ -13			
Propagation Condition		AWGN			

Note 1: The DPCH level is controlled by the power control loop.

The power of the OCNS channel that is added shall make the total power from the cell to be equal Note 2: to Ior.

This gives an SCH Ec/lo of -15dB Note 3:

A.6.3.2.2 Test Requirements

The UE shall start to transmit random access to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA FDD observed during repeated tests shall be at least 90%.

NOTE: The Re-establishment delay in this case can be expressed as

$$T_{connection_release_redirect_UTRA\;FDD} = T_{RRC_procedure_delay} + T_{identify_UTRA\;FDD} + T_{SI_UTRA\;FDD} + T_{RA}$$

where

 $T_{RRC_procedure_delay} = 110 \text{ ms}$

 $T_{identify-UTRA\ FDD} = 500\ ms$

 $T_{SI-UTRA\ FDD}$ = the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 0 ms is assumed in this test case.

 T_{RA} = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 650 ms.

A.6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided

A.6.3.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target GERAN cell within $T_{connection_release_redirect_GERAN}$. This test will partly verify the RRC connection release with redirection to GERAN requirements in clause 6.3.2.2.

The test parameters are given in Tables A.6.3.3.1-1, A.6.3.3.1-2 and A.6.3.3.1-3 below. No measurement gaps are configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "RRCConnectionRelease", is received by the UE from cell 1. The "RRCConnectionRelease" message shall contain all the relevant system information of cell 2.

Table A.6.3.3.1-1: General test parameters for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including ARFCN 1	GSM cells are provided in the "RRCConnectionRelease" message.
T1	S	5	
T2	S	2	

Table A.6.3.3.1-2: Cell specific test parameters for E-UTRA FDD cell (cell #1) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

	Unit	Cell 1		
		T1	T2	
E-UTRA RF Channel Number		1		
BWchannel	MHz	10	0	
OCNG Pattern defined in				
A.3.2.1.1 (OP.1 FDD)		OP.1	FDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB	0)	
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RANote 1	dB			
OCNG_RBNote 1	dB			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	
\hat{E}_s/N_{oc}	dB	4	4	
N_{oc}	dBm/15 kHz	-9	8	
RSRP	dBm/15 kHz	-94	-94	
SCH_RP	dBm/15 kHz	-94	-94	
Propagation Condition		AW	GN	

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

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

Table A.6.3.3.1-3: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		AF	RFNC 1
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

A.6.3.3.2 Test Requirements

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 1120 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to GERAN" observed during repeated tests shall be at least 90%.

NOTE: The test requirement in this test case is expressed as:

 $T_{connection_release_redirect_GERAN} = T_{RRC_procedure_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

 $T_{RRC_procedure_delay} = 110$ ms, which is the time for processing the received message "RRCConnectionRelease."

 $T_{identify\text{-}GERAN} = 1000 \text{ ms}$, which is the time for identifying the target GERAN cell.

 $T_{SI\text{-}GERAN} = 0$; UE does not have to read the system information of the GERAN cell since all relevant SI is provided to the UE in the "RRCConnectionRelease" message.

 T_{RA} = 10 ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

A.6.3.4 Redirection from E-UTRAN TDD to GERAN when System Information is provided

A.6.3.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target GERAN cell within $T_{connection_release_redirect_GERAN}$. This test will partly verify the RRC connection release with redirection to GERAN requirements in clause 6.3.2.2.

The test parameters are given in Tables A.6.3.4.1-1, A.6.3.4.1-2 and A.6.3.4.1-3 below. No measurement gaps are configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "RRCConnectionRelease", is received by the UE from cell 1. The "RRCConnectionRelease" message shall contain all the relevant system information of cell 2.

Table A.6.3.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement	As specified in clause A.3.1.1.2.
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.2.
(E-UTRAN TDD)		Channel R.6 TDD	
Active		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1
			(GSM cell)
CP length		Normal	Applicable to cell 1
Special subframe configuration		•	As specified in table 4.2.1 in TS 36.211. The
		6	same configuration applies to all cells.
Uplink-downlink configuration		1	
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including	GSM cells provided in the
		ARFCN 1	"RRCConnectionRelease" message.
T1	S	5	
T2	S	2	

Table A.6.3.4.1-2: Cell specific test parameters for E-UTRA TDD cell (cell #1) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 1		
		T1	T2	
E-UTRA RF Channel Number		1		
BW _{channel}	MHz	10		
OCNG Pattern defined in				
A.3.2.2.1 (OP.1 TDD)		OP.1 7	TDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	0		
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
$\hat{\mathtt{E}}_{\scriptscriptstyle \mathrm{s}}/\mathtt{I}_{\scriptscriptstyle \mathrm{ot}}$	dB	4	4	
\hat{E}_s/N_{oc}	dB	4	4	
N_{oc}	dBm/15 kHz	-98	3	
RSRP	dBm/15 kHz	-94	-94	
SCH_RP	dBm/15 kHz	-94	-94	
Propagation Condition		AWG	SN .	
spectral density is ac	hieved for all OF	I is fully allocated and a constant DM symbols. e sources not specified in the tes	·	

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

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

Table A.6.3.4.1-3: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		AF	RFNC 1
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

A.6.3.4.2 Test Requirements

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 1120 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to GERAN" observed during repeated tests shall be at least 90%.

NOTE: The test requirement in this test case is expressed as:

 $T_{connection_release_redirect_\ GERAN} = T_{RRC_procedure_delay} + T_{identify_GERAN} + T_{SI_GERAN} + T_{RA}$

 $T_{RRC_procedure_delay} = 110$ ms, which is the time for processing the received message "RRCConnectionRelease."

 $T_{identify\text{-}GERAN} = 1000 \text{ ms}$, which is the time for identifying the target GERAN cell.

A.6.3.5 E-UTRA TDD RRC connection release redirection to UTRA TDD

A.6.3.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within $T_{connection_release_redirect_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in clause 6.3.2.3.

The test parameters are given in table A.6.3.5.1-1, table A.6.3.5.1-2, and table A.6.3.5.1-3. No measurement gaps are configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "RRCConnectionRelease" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "RRCConnectionRelease", is received by the UE from cell 1. The "RRCConnectionRelease" message shall contain all the relevant system information of Cell 2.

Table A.6.3.5.1-1: General test parameters for E-UTRA TDD RRC connection release redirection to UTRA TDD

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	Applicable to cell 1
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
Uplink-downlink configuration of cell 1		1	As specified in table 4.2-2 in TS 36.211
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the "RRCConnectionRelease" message from the E-UTRAN
T1	S	5	
T2	S	1	

Table A.6.3.5.1-2: Cell specific test parameters for cell 1 in E-UTRA TDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 1				
		T1 T2				
E-UTRA RF Channel Number		1				
BW _{channel}	MHz	10				
OCNG Pattern defined in						
A.3.2.2.1 (OP.1 TDD)		OP.1 TDD				
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB	0				
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
\hat{E}_{s}/I_{ot}	dB	4 4				
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98				
\hat{E}_s/N_{oc}	dB	4 4				
RSRP Note 4	dBm/15 kHz	-94 -94				
SCH_RP	dBm/15 kHz	-94 -94				
Propagation Condition		AWGN				

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

 The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 2:
- Interference from other cells and noise sources not specified in the test is assumed to be constant Note 3: over subcarriers and time and shall be modelled as AWGN of appropriate power for $\,N_{oc}\,$ to be
- RSRP levels have been derived from other parameters for information purposes. They are not Note 4: settable parameters themselves.

Table A.6.3.5.1-3: Cell specific test parameters for cell 2 in E-UTRA TDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		Dw	PTS
		T1	T2	T1	T2
UTRA RF Channel Number Note1			Char	nel 1	
PCCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor ^{Note2}	dB	-1.76	-1.76		
\hat{I}_{or}/I_{oc}	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

- Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
- Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
- Note 3: P-CCPCH RSRP, PCCPCH_Ec/lo and DwPCH_Ec/lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.6.3.5.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

NOTE: The time delay can be expressed as: $T_{RRC_procedure_delay} + T_{identify_UTRA\ TDD} + T_{SI_UTRA\ TDD} + T_{RA}$, where:

 $T_{RRC_procedure_delay} = 110$ ms, which is specified in clause 6.3.2.3.

 $T_{identify-UTRA\ TDD} = 500$ ms; which is defined in clause 6.3.2.3.

 $T_{SI\text{-}UTRA\ TDD} = 0$ ms, UE does not have to read the system information of the UTRAN TDD since all relevant SI is provided to the UE in the "RRCConnectionRelease" message.

 $T_{RA} = 40$ ms. This is the additional delay caused by the random access procedure

It gives a total delay of 650 ms.

A.6.3.6 E-UTRA FDD RRC connection release redirection to UTRA TDD

A.6.3.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within $T_{connection_release_redirect_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in clause 6.3.2.3.

The test parameters are given in table A.6.3.6.1-1, table A.6.3.6.1-2, and table A.6.3.6.1-3. No measurement gaps are configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "RRCConnectionRelease" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "RRCConnectionRelease", is received by the UE from cell 1. The "RRCConnectionRelease" message shall contain all the relevant system information of Cell 2.

Table A.6.3.6.1-1: General test parameters for E-UTRA FDD RRC connection release redirection to UTRA TDD

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN		DL Reference Measurement	As specified in clause A.3.1.1.1.
FDD)		Channel R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1.
parameters (E-UTRAN FDD)		Channel R.6 FDD	
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number
			1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is
			used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		16	UTRA cells on UTRA RF channel 1
			provided in the "RRCConnectionRelease"
			message from the E-UTRAN
T1	S	5	
T2	S	1	

Table A.6.3.6.1-2: Cell specific test parameters for cell 1 in E-UTRA FDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 1				
		T1	T2			
E-UTRA RF Channel Number		1				
BW _{channel}	MHz	10				
OCNG Patterns defined in		OP.1 F	-DD			
A.3.2.1.1 (OP.1 FDD)		OP.11	-00			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB	0				
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
\hat{E}_{s}/I_{ot}	dB	4	4			
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98	3			
\hat{E}_s/N_{oc}	dB	4	4			
RSRP Note 4	dBm/15 kHz	-94	-94			
SCH_RP	dBm/15 kHz	-94	-94			
Propagation Condition		AWG	SN .			

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be
- Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.6.3.6.1-3: Cell specific test parameters for cell 2 in E-UTRA FDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		Dw	PTS
		T1	T2	T1	T2
UTRA RF Channel Number Note1			Chan	nel 1	
PCCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor ^{Note2}	dB	-1.76	-1.76		
\hat{I}_{or}/I_{oc}	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

- Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
- Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or} .
- Note 3: P-CCPCH RSRP, PCCPCH_Ec/lo and DwPCH_Ec/lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A. 6.3.6.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

NOTE: The time delay can be expressed as: $T_{RRC\ procedure\ delay} + T_{identify-UTRA\ TDD} + T_{SI-UTRA\ TDD} + T_{RA}$, where:

 $T_{RRC_procedure_delay} = 110$ ms, which is specified in clause 6.3.2.3.

 $T_{identify\text{-}UTRA\ TDD} = 500$ ms; which is defined in clause 6.3.2.3.

 $T_{SI\text{-}UTRA\ TDD} = 0$ ms, UE does not have to read the system information of the UTRAN TDD since all relevant SI is provided to the UE in the "RRCConnectionRelease" message.

 $T_{\text{RA}} = 40 \text{ms}$. This is the additional delay caused by the random access procedure.

This gives a total delay of 650 ms.

A.6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided

A.6.3.7.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within $T_{connection_release_redirect_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in clause 6.3.2.3.

The test parameters are given in table A.6.3.7.1-1, table A.6.3.7.1-2, and table A.6.3.7.1-3. No measurement gaps are configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "RRCConnectionRelease" message not containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "RRCConnectionRelease", is received by the UE from Cell 1.

Table A.6.3.7.1-1: General test parameters for E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2.
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2.
parameters (E-UTRAN TDD)		Channel R.6 TDD	
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is
			used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
CP length		Normal	Applicable to cell 1
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		none	No explicit neighbour list is provided to the UE
T1	S	5	
T2	S	2	

Table A.6.3.7.1-2: Cell specific test parameters for cell 1 in E-UTRA TDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 1
		T1 T2
E-UTRA RF Channel Number		1
BW _{channel}	MHz	10
OCNG Pattern defined in		
A.3.2.2.1 (OP.1 TDD)		OP.1 TDD
PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 1}	dB	
OCNG_RB ^{Note 1}	dB	
\hat{E}_{s}/I_{ot}	dB	4 4
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98
\hat{E}_s/N_{oc}	dB	4 4
RSRP Note 4	dBm/15 kHz	-94 -94
SCH_RP	dBm/15 kHz	-94 -94
Propagation Condition		AWGN

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled
- Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.6.3.7.1-3: Cell specific test parameters for cell 2 in E-UTRA TDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		Dw	PTS
		T1	T2	T1	T2
UTRA RF Channel Number Note1			Char	nel 1	
PCCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor ^{Note2}	dB	-1.76	-1.76		
\hat{I}_{or}/I_{oc}	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

- Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
- Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or} .
- Note 3: P-CCPCH RSRP, PCCPCH_Ec/lo and DwPCH_Ec/lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.6.3.7.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

NOTE: The time delay can be expressed as: $T_{RRC\ procedure\ delay} + T_{identify-UTRA\ TDD} + T_{SI-UTRA\ TDD} + T_{RA}$, where:

 $T_{RRC_procedure_delay} = 110$ ms, which is specified in clause 6.3.2.3.

 $T_{identify-UTRA\ TDD} = 500$ ms; which is defined in clause 6.3.2.3.

T_{SI-UTRA TDD}: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRA TDD cell. 1280 ms is assumed in this test case.

 $T_{RA} = 40 \text{ms}$, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

A.6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided

A.6.3.8.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within $T_{connection_release_redirect_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in clause 6.3.2.3.

The test parameters are given in table A.6.3.8.1-1, table A.6.3.8.1-2, and table A.6.3.8.1-3. No measurement gaps are configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "RRCConnectionRelease" message not containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "RRCConnectionRelease", is received by the UE from Cell 1.

Table A.6.3.8.1-1: General test parameters for E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	Applicable to cell 1
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		none	No explicit neighbour list is provided to the UE
T1	S	5	
T2	S	2	

Table A.6.3.8.1-2: Cell specific test parameters for cell 1 in E-UTRA FDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 1					
		T1 T2					
E-UTRA RF Channel Number		1					
BW _{channel}	MHz	10					
OCNG Patterns defined in		OP.1 F	DD				
A.3.2.1.1 (OP.1 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB	0					
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	4	4				
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98					
\hat{E}_s/N_{oc}	dB	4	4				
RSRP Note 4	dBm/15 kHz	-94	-94				
SCH_RP	dBm/15 kHz	-94	-94				
Propagation Condition		AWG					

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled
- Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.6.3.8.1-3: Cell specific test parameters for cell 2 in E-UTRA FDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		(0 DwP		PTS
		T1	T2	T1	T2
UTRA RF Channel Number Note1			Chan	inel 1	
PCCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor ^{Note2}	dB	-1.76	-1.76		
\hat{I}_{or}/I_{oc}	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

- Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
- Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or} .
- Note 3: P-CCPCH RSRP, PCCPCH_Ec/lo and DwPCH_Ec/lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.6.3.8.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

NOTE: The time delay can be expressed as: $T_{RRC\ procedure\ delay} + T_{identify-UTRA\ TDD} + T_{SI-UTRA\ TDD} + T_{RA}$, where:

 $T_{RRC_procedure_delay} = 110$ ms, which is specified in clause 6.3.2.3.

 $T_{identify-UTRA\ TDD} = 500$ ms; which is defined in clause 6.3.2.3.

T_{SI-UTRA TDD}: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRA TDD cell. 1280 ms is assumed in this test case.

 $T_{RA} = 40$ ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

A.6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information

A.6.3.9.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct performing the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in clause 6.3.2.1.

The test parameters are given in Tables A.6.3.9.1-1, A.6.3.9.1-2 and A.6.3.9.1-3 below. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "RRCConnectionRelease" message not containing any system information of Cell 2 shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the UE shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

Table A.6.3.9.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN FDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	S	≤5	
T2	S	2	

Table A.6.3.9.1-2: Cell specific test parameters for cell #1 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
OCNG Pattern defined in					
A.3.2.1.1 (OP.1 FDD)		OP.1 F	OP.1 FDD		
PBCH_RA	dB				
PBCH_RB	dB	0			
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	4	4		
$N_{oc}^{ m Note~3}$	dBm/15 kHz	-98			
\hat{E}_s/N_{oc}	dB	4	4		
RSRP Note 4	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWGN			

- Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.6.3.9.1-3: Cell specific test parameters for cell #2 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 2			
		T1	T1		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.941			
\hat{I}_{or}/I_{oc}	dB	-∞ 0.02			
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/Io ^{Note 3}	dB	-∞ -13			
Propagation Condition		AWGN			

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal

Note 3: This gives an SCH Ec/lo of -15dB

A.6.3.9.2 Test Requirements

The UE shall start to send random access to the target UTRA FDD cell (Cell 2) less than 1930 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to UTRAN" observed during repeated tests shall be at least 90%.

NOTE: The test requirement in this case can be expressed as

$$T_{connection_release_redirect_UTRA\;FDD} = T_{RRC_procedure_delay} + T_{identify_UTRA\;FDD} + T_{SI_UTRA\;FDD} + T_{RA}$$

where

 $T_{RRC procedure delay} = 110 \text{ ms}$

 $T_{identify-UTRA\ FDD} = 500\ ms$

 $T_{SI\text{-}UTRA\ FDD}$ = the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. Since no SI is provided, 1280 ms is assumed in this test case.

 T_{RA} = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 1930 ms.

A.6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided

A.6.3.10.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target GERAN cell within $T_{connection_release_redirect_GERAN}$. This test will partly verify the RRC connection release with redirection to GERAN requirements in clause 6.3.2.2.

The test parameters are given in Tables A.6.3.10.1-1, A.6.3.10.1-2 and A.6.3.10.1-3 below. No measurement gaps are configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI

containing the RRC message, "RRCConnectionRelease", is received by the UE from cell 1. The "RRCConnectionRelease" message shall not contain any system information of cell 2.

Table A.6.3.10.1-1: General test parameters for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement	As specified in clause A.3.1.1.1.
		Channel R.0 FDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1.
(E-UTRAN FDD)		Channel R.6 FDD	
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1
			(GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including	Only the list of GERAN carrier frequencies is
		ARFCN 1	provided in the "RRCConnectionRelease"
			message.
T1	S	≤5	
T2	S	4	

Table A.6.3.10.1-2: Cell specific test parameters for E-UTRA FDD cell (cell #1) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 1		
		T1 T2		
E-UTRA RF Channel Number		1		
BW _{channel}	MHz	10		
OCNG Pattern defined in				
A.3.2.1.1 (OP.1 FDD)		OP.1 FDD		
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB	_		
PHICH_RB	dB	0		
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	4 4		
\hat{E}_s/N_{oc}	dB	4 4		
N_{oc}	dBm/15 kHz	-98		
RSRP	dBm/15 kHz	-94 -94		
SCH_RP	dBm/15 kHz	-94 -94		
Propagation Condition		AWGN		

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

Table A.6.3.10.1-3: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 2		
		T1	T2	
Absolute RF Channel Number		ARFNC 1		
RXLEV	dBm	-Infinity	-75	
GSM BSIC		N/A	Valid	

A.6.3.10.2 Test Requirements

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 3020 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to GERAN" observed during repeated tests shall be at least 90%.

NOTE: The test requirement in this test case is expressed as:

 $T_{connection_release_redirect_\ GERAN} = T_{RRC_procedure_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

 $T_{RRC_procedure_delay} = 110$ ms, which is the time for processing the received message "RRCConnectionRelease."

 $T_{identify\text{-}GERAN} = 1000 \text{ ms}$, which is the time for identifying the target GERAN cell.

T_{SI-GERAN} = 1900 ms, which is the maximum time allowed to read BCCH data from the target GERAN cell.

 $T_{RA} = 10$ ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

A.6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided

A.6.3.11.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target GERAN cell within $T_{connection_release_redirect_GERAN}$. This test will partly verify the RRC connection release with redirection to GERAN requirements in clause 6.3.2.2.

The test parameters are given in Tables A.6.3.11.1-1, A.6.3.11.1-2 and A.6.3.11.1-3 below. No measurement gaps are configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "RRCConnectionRelease", is received by the UE from cell 1. The "RRCConnectionRelease" message shall not contain any system information of cell 2.

Table A.6.3.11.1-1: General test parameters for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement	As specified in clause A.3.1.1.2.
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.2.
(E-UTRAN TDD)		Channel R.6 TDD	
Active		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1
			(GSM cell)
CP length		Normal	Applicable to cell 1
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The
		0	same configuration applies to all cells.
Uplink-downlink configuration		1	
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including	Only the list of GERAN carrier frequencies is
		ARFCN 1	provided in the "RRCConnectionRelease"
			message.
T1	S	≤5	
T2	S	4	

Table A.6.3.11.1-2: Cell specific test parameters for E-UTRA TDD cell (cell #1) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
OCNG Pattern defined in					
A.3.2.2.1 (OP.1 TDD)		OP.1 T	ΓDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	0			
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
\hat{E}_{s}/I_{ot}	dB	4	4		
\hat{E}_s/N_{oc}	dB	4	4		
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWG	SN .		

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

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

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

Table A.6.3.11.1-3: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 2		
		T1	T2	
Absolute RF Channel Number		ARFNC 1		
RXLEV	dBm	-Infinity	-75	
GSM BSIC		N/A	Valid	

A.6.3.11.2 Test Requirements

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 3020 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to GERAN" observed during repeated tests shall be at least 90%.

NOTE: The test requirement in this test case is expressed as:

 $T_{connection_release_redirect_\ GERAN} = T_{RRC_procedure_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

 $T_{RRC_procedure_delay} = 110$ ms, which is the time for processing the received message "RRCConnectionRelease."

 $T_{identify\text{-}GERAN} = 1000 \text{ ms}$, which is the time for identifying the target GERAN cell.

T_{SI-GERAN} = 1900 ms, which is the maximum time allowed to read BCCH data from the target GERAN cell.

 $T_{RA} = 10$ ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

A.6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided

A.6.3.12.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRAN TDD to the target UTRAN FDD cell within $T_{connection_release_redirect_UTRAN\ FDD}$. This test will partly verify the RRC connection release with redirection to UTRAN FDD requirements in clause 6.3.2.1.

The test parameters are given in table A.6.3.12.1-1, table A.6.3.12.1-2, and table A.6.3.12.1-3. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "RRCConnectionRelease" message not containing any system information of Cell 2 shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message, "RRCConnectionRelease", is received by the UE from Cell 1.

Table A.6.3.12.1-1: General test parameters for E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2.
Active cell		Cell 1	Cell 1 is on E-UTRAN RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRAN RF channel number 1.
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BW _{channel})	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length		Normal	Applicable to cell 1
UTRAN RF Channel Number		1	One UTRAN TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	_
Monitored UTRAN FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	S	≤5	
T2	S	2	

Table A.6.3.12.1-2: Cell specific test parameters for cell 1 in E-UTRAN TDD RRC connection release redirection to UTRAN FDD test without SI provided

Parameter	Unit	Cell 1				
		T1	T2			
E-UTRAN RF Channel		1				
Number						
BW _{channel}	MHz	10				
OCNG Pattern defined in		OP.1	TDD			
A.3.2.2.1 (OP.1 TDD)		OF.1	IDD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB	0				
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
\hat{E}_{s}/I_{ot}	dB	4	4			
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98	3			
\hat{E}_s/N_{oc}	dB	4	4			
RSRP Note 4	dBm/15 kHz	-94	-94			
SCH_RP	dBm/15 kHz	-94	-94			
Propagation Condition		AWGN				
Note 1: OCNG shall be use	d augh that the gall is	fully allocated and a constant	t total transmitted navyer			

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

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.6.3.12.1-3: Cell specific test parameters for cell 2 in E-UTRAN TDD RRC connection release redirection to UTRAN FDD test without SI provided

Parameter	Unit	Cell 2			
		T1	T1		
UTRAN RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.94	1		
\hat{I}_{or}/I_{oc}	dB	-∞	0.02		
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/Io ^{Note 3}	dB	-∞ -13			
Propagation Condition		AWG	N		

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or} .

Note 3: This gives an SCH Ec/lo of -15dB

A.6.3.12.2 Test Requirements

The UE shall start to send random access to the target UTRAN FDD cell (Cell 2) less than 1930 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRAN FDD observed during repeated tests shall be at least 90%.

NOTE: The time delay can be expressed as: $T_{RRC_procedure_delay} + T_{identify_UTRAN\ FDD} + T_{SI_UTRAN\ FDD} + T_{RA}$, where:

 $T_{RRC\ procedure\ delay} = 110$ ms, which is specified in clause 6.3.2.1.

 $T_{identify-UTRAN \, FDD} = 500 \, ms$; which is defined in clause 6.3.2.1.

 $T_{SI\text{-}UTRAN\ FDD}$: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRAN FDD cell. 1280 ms is assumed in this test case.

 $T_{RA} = 40$ ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

A.7 Timing and Signalling Characteristics

A.7.1 UE Transmit Timing

A.7.1.1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests

A.7.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in clause 7.1.2.

For this test a single cell is used. Table A.7.1.1.1-1 defines the strength of the transmitted signals and the propagation condition. The transmit timing is verified by the UE transmitting SRS using the configuration defined in Table A.7.1.1.1-2.

Table A.7.1.1.1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN FDD

Barrandar	11-2		Value		
Parameter	Unit	Test 1	Test 2	Test 3	Test 4
E-UTRA RF Channel Number		1	1	1	1
Channel Bandwidth (BW _{channel})	MHz	10	10	1.4	10
DRX cycle	ms	N/A	80 ^{Note5}	N/A	640 ^{Note5}
PDCCH/PCFICH/PHICH					
Reference measurement channel Nates		R.6 FDD	R.6 FDD	R.8 FDD	R.6 FDD
OCNG Pattern ^{Note2}		OP.2 FDD	OP.2 FDD	OP.4 FDD	OP.2 FDD
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA	dB 0	0	0	0	
PHICH_RB					
PDCCH_RA					
PDCCH_RB		I		i	
OCNG_RA ^{Note3}					
OCNG_RB ^{Note3}	1				
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
$\hat{\mathtt{E}}_{\mathrm{s}}/\mathtt{I}_{\mathrm{ot}}$	dB	3	3	3	3
\hat{E}_s/N_{oc}	dB	3	3	3	3
lo ^{Note4}	dBm/9 MHz	-65.5	-65.5	N/A	-65.5
10	dBm/1.08 MHz	N/A	N/A	-74.7	N/A
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.3.1.

Note 2: For the OCNG pattern, see clause A.3.2.

Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: lo level has been derived from other parameters for information purpose. It is not a settable

Note 5: DRX related parameters are defined in Table A.7.1.1.1-3.

Table A.7.1.1.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN FDD

Test 1		Value			
	Test 2	Test 3	Test 4	Comment	
bw5	bw5	bw7	bw5		
sc1	sc3	sc1	sc3		
FALSE	FALSE	FALSE	FALSE		
N/A	N/A	N/A	N/A	Not applicable for FDD	
0	0	0	0	No hopping	
hbw0	hbw0	hbw0	hbw0		
0	0	0	0		
TRUE	TRUE	TRUE	TRUE	Indefinite duration	
0	77	0	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 4, respectively.	
0	0	0	0		
cs0	cs0	cs0	cs0	No cyclic shift	
an1 Number of antenna po used for SF transmission					
	sc1 FALSE N/A 0 hbw0 0 TRUE 0 cs0	sc1 sc3 FALSE FALSE N/A N/A 0 0 hbw0 hbw0 0 0 TRUE TRUE 0 77 0 0 cs0 cs0	sc1 sc3 sc1 FALSE FALSE FALSE N/A N/A N/A 0 0 0 hbw0 hbw0 hbw0 0 0 0 TRUE TRUE TRUE 0 77 0 0 0 0 cs0 cs0 cs0	sc1 sc3 sc1 sc3 FALSE FALSE FALSE FALSE N/A N/A N/A N/A 0 0 0 0 hbw0 hbw0 hbw0 hbw0 0 0 0 0 TRUE TRUE TRUE TRUE 0 77 0 317 0 0 0 0 cs0 cs0 cs0 cs0	

Table A.7.1.1.1-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 4 for E-UTRAN FDD

Field	Va	lue	Comment			
rieid	Test 2	Test 4				
onDurationTimer	psf1	psf1				
drx-InactivityTimer	psf1	psf1				
drx-RetransmissionTimer	psf1	psf1				
longDRX-CycleStartOffset	sf80	sf640				
shortDRX disable disable						
Note: For further information see c	lause 6.3.2 in	TS 36.331.				

A.7.1.1.2 Test Requirements

For parameters specified in Tables A.7.1.1.1-1 and A.7.1.1.1-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 4, respectively):

- a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by $+64 \times T_S$ (for Test 1 and Test 2) or $+32 \times T_S$ (for Test 4) compared to that in (a).
- c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 4.

d) The test system shall verify that the UE transmit timing offset stays within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 4 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

For the 1.4MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for non-DRX (Test 3):

- a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S \pm 24 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by $+128 \times T_S$ (approximately $+4\mu s$) compared to that in (a).
- c) The test system shall verify that the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within $N_{TA} \times T_S \pm 24 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- d) The test system shall verify that the UE transmit timing offset stays within $N_{TA} \times T_S \pm 24 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

A.7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy Tests

A.7.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in clause 7.1.2.

For this test a single cell is used. Table A.7.1.2.1-1 defines the strength of the transmitted signals and the propagation condition. The transmit timing is verified by the UE transmitting SRS using the configuration defined in Table A.7.1.2.1-2.

Table A.7.1.2.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Damana at an	1111		Valu	Value				
Parameter	Unit	Test 1	Test 2	Test 3	Test 4			
E-UTRA RF Channel Number		1	1	1	1			
Channel Bandwidth (BW _{channel})	MHz	10	10	1.4	10			
Special subframe		6	6	6	6			
configuration Note1								
Uplink-downlink configuration Note2		1	1	1	1			
DRX cycle	ms	N/A	80 ^{Note7}	N/A	640 ^{Note7}			
PDCCH/PCFICH/PHICH								
Reference measurement		R.6 TDD	R.6 TDD	R.8 TDD	R.6 TDD			
channel ^{Note3}								
OCNG Pattern ^{Note4}		OP.2 TDD	OP.2 TDD	OP.4 TDD	OP.2 TDD			
PBCH_RA	dB	0	0	0	0			
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA		0	0	0	0			
PHICH_RB		U	U	U	U			
PDCCH_RA								
PDCCH_RB								
OCNG_RA ^{Note5}								
OCNG_RB ^{Note5}								
N_{oc}	dBm/15 kHz	-98	-98	-98	-98			
\hat{E}_{s}/I_{ot}	dB	3	3	3	3			
\hat{E}_s/N_{oc}	dB	3	3	3	3			
Io ^{Note6}	dBm/9 MHz	-65.5	-65.5	N/A	-65.5			
IU	dBm/1. 08 MHz	N/A	N/A	-74.7	N/A			
Propagation condition	-	AWGN	AWGN	AWGN	AWGN			

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.

Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.

Note 3: For the reference measurement channels, see clause A.3.1.

Note 4: For the OCNG pattern, see clause A.3.2.

Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted

power spectral density is achieved for all OFDM symbols.

Note 6: lo level has been derived from other parameters for information purpose. It is not a

settable parameter.

Note 7: DRX related parameters are defined in Table A.7.1.2.1-3.

Table A.7.1.2.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

	Va	Comment				
Test 1	Test 2	Test 3	Test 4	Comment		
bw5	bw5	bw7	bw5			
sc3	sc3	sc3	sc3	Once every 5 subframes		
FALSE	FALSE	FALSE	FALSE			
FALSE	FALSE	FALSE	FALSE			
0	0	0	0	No hopping		
hbw0	hbw0	hbw0	hbw0			
0	0	0	0			
TRUE	TRUE	TRUE	TRUE	Indefinite duration		
15	85	15	325	SRS periodicity of 10, 80, 10 and 320 ms for Test 1, 2, 3 and 4 respectively.		
0	0	0	0			
cs0	cs0	cs0	cs0	No cyclic shift		
	an1 Number used for transmis					
	bw5 sc3 FALSE 0 hbw0 0 TRUE	Test 1 Test 2 bw5 bw5 sc3 sc3 FALSE FALSE FALSE FALSE 0 0 hbw0 hbw0 0 0 TRUE TRUE 15 85 0 0 cs0 cs0	bw5 bw5 bw7 sc3 sc3 sc3 FALSE FALSE FALSE FALSE FALSE FALSE 0 0 0 hbw0 hbw0 hbw0 0 0 0 TRUE TRUE TRUE 15 85 15 0 0 0 cs0 cs0 cs0	Test 1 Test 2 Test 3 Test 4 bw5 bw5 bw7 bw5 sc3 sc3 sc3 sc3 FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE 0 0 0 0 hbw0 hbw0 hbw0 hbw0 0 0 0 0 TRUE TRUE TRUE TRUE 15 85 15 325 0 0 0 0 cs0 cs0 cs0 cs0		

Table A.7.1.2.1-3: DRX Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 4 for E-UTRAN TDD

Field	Va	lue	Comment			
rieiu	Test 2	Test 4				
onDurationTimer	psf1	psf1				
drx-InactivityTimer	psf1	psf1				
drx-RetransmissionTimer	psf1	psf1				
longDRX-CycleStartOffset	sf80	Sf640				
shortDRX	disable	disable				
Note: For further information see clause 6.3.2 in TS 36.331.						

A.7.1.2.2 Test Requirements

For parameters specified in Tables A.7.1.2.1-1 and A.7.1.2.1-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 4, respectively):

- a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by $+64 \times T_S$ (for Test 1 and Test 2) or $+32 \times T_S$ (for Test 4) compared to that in (a).
- c) The test system shall verify that for test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for test 2 and test 4.
- d) The test system shall verify that the UE transmit timing offset stays within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 4 the UE

transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

For the 1.4MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for non-DRX (Test 3):

- a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $(N_{TA} + 624) \times T_S \pm 24 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by $+128 \times T_S$ (approximately $+4 \mu s$) compared to that in (a).
- c) The test system shall verify that the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within $(N_{TA}+624)\times T_S\pm 24\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- d) The test system shall verify that the UE transmit timing offset stays within $(N_{TA} + 624) \times T_S \pm 24 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

A.7.1.3 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell

A.7.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in clause 7.1.2.

For this test two cells are used. Cell 1 is PCell and Cell 2 is SCell. Both PCell and SCell are in the primary Timing Advance Group (pTAG). Table A.7.1.3.1-1 defines the strength of the transmitted signals and the propagation condition. The transmit timing is verified by the UE transmitting SRS using the configuration defined in Table A.7.1.3.1-2.

Table A.7.1.3.1-1: General test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN FDD

Denomination	1114		Cell 1			Cell 2	
Parameter	Unit	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1	2	2	2
Channel Bandwidth (BW _{channel})	MHz	20	20	20	20	20	20
Active PCell	1	Cell 1	Cell 1	Cell 1			
Active SCell	1				Cell 2	Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG	pTAG	pTAG
DRX cycle	ms	N/A	80 ^{Note5}	640 ^{Note5}	N/A	80 ^{Note5}	640 ^{Note5}
PDCCH/PCFICH/PHICH	-	-			·		-
Reference measurement channel Note1		R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD
OCNG Pattern ^{Note2}		OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA	dB	0	0	0	0	0	0
PHICH_RB	7						
PDCCH_RA							
PDCCH RB							ļ
OCNG_RA ^{Note3}							
OCNG_RB ^{Note3}							ļ
N_{oc}	dBm/15 kHz	-98	-98	-98	-98	-98	-98
$\mathbf{\hat{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	3	3	3	3	3	3
\hat{E}_s/N_{oc}	dB	3	3	3	3	3	3
lo ^{Note4}	dBm/18 MHz	-62.5	-62.5	-62.5	-62.5	-62.5	-62.5
Propagation condition	-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.3.1.

Note 2: For the OCNG pattern, see clause A.3.2.

Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 5: DRX related parameters are defined in Table A.7.1.3.1-3.

Table A.7.1.3.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN FDD

Field		Cell 1			Cell 2		Comment
Field	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3	Comment
srsBandwidthConfiguratio n	bw5	bw5	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc3	sc1	sc3	sc3	
ackNackSrsSimultaneous Transmission	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	317	0	77	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 3, respectively.
transmissionComb	0	0	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	an1	an1	Number of SRS antenna ports
NOTE: For further inform	ation see cla	ause 6.3.2 in	TS 36.331.				

Table A.7.1.3.1-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN FDD

Field	Tes	st 2	Tes	st 3	Comment				
	Cell 1	Cell 2	Cell 1	Cell 2					
onDurationTimer	psf1	psf1	psf1	psf1					
drx-InactivityTimer	psf1	psf1	psf1	psf1					
drx-RetransmissionTimer	psf1	psf1	psf1	psf1					
IongDRX-CycleStartOffset	sf80	sf80	Sf640	Sf640					
shortDRX	disable	disable	disable	Disable					
NOTE: For further informat	NOTE: For further information see clause 6.3.2 in TS 36.331.								

A.7.1.3.2 Test Requirements

For parameters specified in Tables A.7.1.3.1-1, and A.7.1.3.1-2 the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2.

The following sequence of events shall be used to verify that the requirements are met.

The test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test 1) and DRX with a cycle length of 80 ms or a cycle length of 640 mss(Test 2 and 3, respectively):

- a) After the SCell (Cell 2) is activated, the test system shall verify that the UE transmit timing offsets of both PCell and SCell are within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
- b) The test system adjusts the downlink transmit timing for the PCell (Cell 1) by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).
- c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offsets of both PCell and SCell are within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offsets of both PCell and SCell stay within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

A.7.1.4 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell

A.7.1.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in clause 7.1.2.

For this test two cells are used. Cell 1 is PCell and Cell 2 is SCell. Both PCell and SCell are in the primary Timing Advance Group (pTAG). Table A.7.1.4.1-1 defines the strength of the transmitted signals and the propagation condition. The transmit timing is verified by the UE transmitting SRS using the configuration defined in Table A.7.1.4.1-2.

Table A.7.1.4.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Davamatan	l lm!4		Cell 1			Cell 2	
Parameter	Unit	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1	2	2	2
Channel Bandwidth (BW _{channel})	MHz	20	20	20	20	20	20
E-UTRA RF Channel Number		1	1	1	2	2	2
Active PCell		Cell 1	Cell 1	Cell 1			
Active SCell					Cell 2	Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG	pTAG	pTAG
Special subframe		6	6	6	6	6	6
configuration Note1							
Uplink-downlink configuration Note2		1	1	1	1	1	1
DRX cycle	ms	OFF	80 ^{Note7}	640 ^{Note7}	OFF	80 ^{Note7}	640 ^{Note7}
PDCCH/PCFICH/PHICH		R.10	R.10	R.10	R.10	R.10	R.10
Reference measurement		TDD	TDD	TDD	TDD	TDD	TDD
channel ^{Note3}							
OCNG Pattern ^{Note4}		OP.8	OP.8	OP.8	OP.8	OP.8	OP.8
		TDD	TDD	TDD	TDD	TDD	TDD
PBCH_RA	dB	0	0	0	0	0	0
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA		0	0	0		0	0
PHICH_RB		O	O			U	
PDCCH_RA							
PDCCH_RB							
OCNG_RA ^{Note5}							
OCNG_RB ^{Note5}							
N_{oc}	dBm/15 kHz	-98	-98	-98	-98	-98	-98
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	3	3	3	3	3	3
\hat{E}_s/N_{oc}	dB	3	3	3	3	3	3
Io ^{Note6}	dBm/18 MHz	-62.5	-62.5	-62.5	-62.5	-62.5	-62.5
Propagation condition	-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.

Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.

Note 3: For the reference measurement channels, see clause A.3.1.

Note 4: For the OCNG pattern, see clause A.3.2.

Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 6: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 7: DRX related parameters are defined in Table A.7.1.4.1-3.

Table A.7.1.4.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

F:-I-I	Cell 1				Cell 2		Comment	
Field Test 1	T ēe sti 1	Test 2	Test 3	Test 1	Test 2	Test 3	Tset3	Tset3
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	bw5	bw5		
srsSubframeConfiguration	sc3	sc3	sc3	sc3	sc3	sc3	Once every 5 subframes	
ackNackSrsSimultaneous Transmission	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		
srsBandwidth	0	0	0	0	0	0	No hopping	
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	hbw0	hbw0		
frequencyDomainPosition	0	0	0	0	0	0		
duration	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	Indefinite duration	
Srs-ConfigurationIndex	15	85	325	15	85	325	SRS periodicity of 10, 80 ms and 320ms for Test 1, 2 and 3, respectively.	
transmissionComb	0	0	0	0	0	0		
cyclicShift	cs0	cs0	cs0	cs0	cs0	cs0	No cyclic shift	
srsAntennaPort	an1	an1	an1	an1	an1	an1	Number of SRS antenna ports	
Note: For further inform	ation see c	lause 6.3.2	2 in TS 36.3	331.	•	•		

Table A.7.1.4.1-3: DRX Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN TDD

Field	Tes	st 2	Tes	Comment				
rieia	Cell 1	Cell 2	Cell 1	Cell 2]			
onDurationTimer	psf1	psf1	psf1	psf1				
drx-InactivityTimer	psf1	psf1	psf1	psf1				
drx-RetransmissionTimer	psf1	psf1	psf1	psf1				
longDRX-CycleStartOffset	sf80	sf80	Sf640	Sf640				
shortDRX disable disable disable disable								
Note: For further information	Note: For further information see clause 6.3.2 in TS 36.331.							

A.7.1.4.2 Test Requirements

For parameters specified in Tables A.7.1.4.1-1 and A.7.1.4.1-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2.

The following sequence of events shall be used to verify that the requirements are met.

The test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test 1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Test 2 and 3, respectively):

- a) After the SCell (Cell 2) is activated, the test system shall verify that the UE transmit timing offsets of both PCell and SCell are within $(N_{TA}+624)\times T_S\pm 12\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
- b) The test system adjusts the downlink transmit timing for the PCell (Cell 1) by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).
- c) The test system shall verify that for test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offsets of both PCell and SCell are within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). Skip this step for test 2 and test 3.

d) The test system shall verify that the UE transmit timing offsets of both PCell and SCell stay within (N_{TA} + 624)× T_S ± 12× T_S with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

A.7.1.4A E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell for 20 MHz + 10 MHz

A.7.1.4A.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.7.1.4.1.

The parameters of this test are the same as defined in Subclause A.7.1.4.1 except that the values of the parameters in the Table A.7.1.4A.1-1 will replace the values of the corresponding parameters in A.7.1.4.1-1. Parameters used for the sounding reference symbol configuration and DRX configuration are unchanged from table A.7.1.4.1-2 and table A.7.1.4.1-3.

Table A.7.1.4A.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD for 20 MHz +10 MHz

Doromotor	Unit		Cell 1			Cell 2	
Parameter	Unit	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
Channel Bandwidth (BW _{channel})	MHz	20	20	20	10	10	10
PDCCH/PCFICH/PHICH Reference measurement channel ^{Note3}		R.10 TDD	R.10 TDD	R.10 TDD	R.6 TDD	R.6 TDD	R.6 TDD
OCNG Pattern ^{Note4}		OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
lo ^{Note6}	dBm/18 MHz	-62.5	-62.5	-62.5	N/A	N/A	N/A
10	dBm/9 MHz	N/A	N/A	N/A	-65.5	-65.5	-65.5

A.7.1.4A.2 Test Requirements

The test requirements defined in section A.7.1.4.2 shall apply to this test case.

A.7.1.5 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for 5MHz Bandwidth

A.7.1.5.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.7.1.1.1.

The parameters of this test are the same as defined in Subclause A.7.1.1.1 except that the values of the parameters in Test 1 in the Table A.7.1.5.1-1 will replace the values of the corresponding parameters in A.7.1.1.1-1. Only Test 1 is defined for the 5MHz bandwidth.

Table A.7.1.5.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN FDD for 5MHz bandwidth

Paramata.	l la it	Value
Parameter	Unit	Test 1
Channel Bandwidth (BW _{channel})	MHz	5
PDCCH/PCFICH/PHICH		
Reference measurement channel ^{Note1}		R.11 FDD
OCNG Pattern ^{Note2}		OP.16 FDD
Io ^{Note4}	dBm/4.5 MHz	-68.5

Note 1: For the reference measurement channels, see clause A.3.1.

Note 2: For the OCNG pattern, see clause A.3.2.

Note 3: See Table A.7.1.1.1-1 for the other parameters.

Note 4: This test is according to the principle defined in section A.3.7.2.

A.7.1.5.2 Test Requirements

The test requirements defined in section A.7.1.1.2 shall apply to this test case.

A.7.1.6 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell in sTAG

A.7.1.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits for SCell in sTAG. This test will verify the requirements in clause 7.1.2.

For this test two cells are used. Cell 1 is PCell and Cell 2 is SCell. PCell is in the Primary Timing Advance Group (pTAG) and Scell is in the secondary Timing Advance Group (sTAG). Table A.7.1.6.1-1 defines the strength of the transmitted signals and the propagation condition. The transmit timing for Scell in sTAG is verified by the UE transmitting SRS using the configuration defined in Table A.7.1.6.1-2.

Table A.7.1.6.1-1: General test Parameters for UE Transmit Timing Accuracy Tests for Scell in sTAG for E-UTRAN FDD

Davamatav	l l mit	Се	II 1	Cel	12
Parameter	Unit	Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth (BW _{channel})	MHz	10	10	10	10
Active PCell		Cell 1	Cell 1		
Active SCell				Cell 2	Cell 2
TAG configuration		pTAG	pTAG	sTAG	sTAG
DRX cycle	ms	OFF	80 ^{Note5}	OFF	80 ^{Note5}
PDCCH/PCFICH/PHICH Reference measurement channel ^{Note1}		R.6 FDD	R.6 FDD	R.6 FDD	R.6 FDD
OCNG Pattern ^{Note2}		OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RB OCNG_RA OCNG_RB POCNG_RB	dB	0	0	0	0
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
\hat{E}_{s}/I_{ot}	dB	3	3	3	3
\hat{E}_s/N_{oc}	dB	3	3	3	3
Io ^{Note4}	dBm/9 MHz	-65.5	-65.5	-65.5	-65.5
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.3.1.

Note 2: For the OCNG pattern, see clause A.3.2.

Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 5: DRX related parameters are defined in Table A.7.1.6.1-3.

Table A.7.1.6.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for Scell in sTAG for E-UTRAN FDD

Field	Ce	II 1	Ce	II 2	Comment
Field	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguratio n	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneous Transmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further inform	nation see cla	ause 6.3.2 in	TS 36.331		

Table A.7.1.6.1-3: drx-Configuration to be used in Test 2 of UE Transmit Timing Accuracy for SCell in sTAG for E-UTRAN FDD

Field	Cell 1	Cell 2	Comment	
onDurationTimer	psf1	psf1		
drx-InactivityTimer	psf1	psf1		
drx-RetransmissionTimer	psf1	psf1		
IongDRX-CycleStartOffset	sf80	sf80		
shortDRX	disable	disable		
Note: For further information see clause 6.3.2 in TS 36.331.				

A.7.1.6.2 Test Requirements

For parameters specified in Tables A.7.1.6.1-1, and A.7.1.6.1-2 the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate for Scell in sTAG shall be within the limits defined in clause 7.1.2.

The following sequence of events shall be used to verify that the requirements are met.

For Test1 and Test2, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX and DRX with a cycle length of 80 ms:

- a) After the SCell (Cell 2) is activated, the test system shall verify that the UE transmit timing offsets for SCell in sTAG are within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of the activated Scell.
- b) The test system adjusts the downlink transmit timing for the activated Scell (Cell 2) by $+64 \times T_S$ (approximately $+2\mu s$) compared to that in (a).
- c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate for Scell in sTAG shall be according to the requirements in clause 7.1.2 until the UE transmit timing offsets of SCell within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2). Skip this step for Test 2.
- d) The test system shall verify that the UE transmit timing offsets of the SCell in sTAG stay within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).

A.7.1.7 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG

A.7.1.7.1 Test Purpose and Environment

The purpose of this test is to verify that the UE is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits for SCell in sTAG. This test will verify the requirements in clause 7.1.2.

For this test two cells are used. Cell 1 is PCell and Cell 2 is SCell. PCell is in the Primary Timing Advance Group (pTAG) and Scell is in the secondary Timing Advance Group (sTAG). Table A.7.1.7.1-1 defines the strength of the transmitted signals and the propagation condition. The transmit timing for Scell in sTAG is verified by the UE transmitting SRS using the configuration defined in Table A.7.1.7.1-2.

Table A.7.1.7.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for Scell in sTAG for E-UTRAN TDD

Parameter	Unit	С	ell 1	C	Cell 2	
Parameter		Test 1	Test 2	Test 1	Test 2	
E-UTRA RF Channel Number		1	1	2	2	
Channel Bandwidth (BW _{channel})	MHz	10	10	10	10	
E-UTRA RF Channel Number		1	1	2	2	
Active PCell		Cell 1	Cell 1			
Active SCell				Cell 2	Cell 2	
TAG configuration		pTAG	pTAG	sTAG	sTAG	
Special subframe		6	6	6	6	
configuration Note 1						
Uplink-downlink configuration Note2		1	1	1	1	
DRX cycle	ms	OFF	80 ^{Note7}	OFF	80 ^{Note7}	
PDCCH/PCFICH/PHICH						
Reference measurement		R.6 TDD	R.6 TDD	R.6 TDD	R.6 TDD	
channel ^{Note3}						
OCNG Pattern ^{Note4}		OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	
PBCH_RA	dB	0	0	0	0	
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA		0	0		0	
PHICH_RB		0	0		0	
PDCCH_RA						
PDCCH_RB						
OCNG_RA ^{Note5}						
OCNG_RB ^{Note5}						
N_{oc}	dBm/15	-98	-98	-98	-98	
	kHz					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	3	3	3	3	
\hat{E}_s/N_{oc}	dB	3	3	3	3	
Io ^{Note6}	dBm/9 MHz	65.5	65.5	65.5	65.5	
Propagation condition	-	AWGN	AWGN	AWGN	AWGN	

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.

Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.

Note 3: For the reference measurement channels, see clause A.3.1.

Note 4: For the OCNG pattern, see clause A.3.2.

Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 6: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 7: DRX related parameters are defined in Table A.7.1.7.1-3.

Table A.7.1.7.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for Scell in sTAG for E-UTRAN TDD

Field	Cell 1		Cell 2		Comment
Field	Test 1	Test 2	Test 1	Test 2	7
srsBandwidthConfiguratio n	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneous Transmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further inform	nation see claus	e 6.3.2 in TS	36.331.	•	

Table A.7.1.7.1-3: DRX Configuration to be used in Test 2 of UE Transmit Timing Accuracy for SCell in sTAG for E-UTRAN TDD

Field	Cell 1	Cell 2	Comment	
onDurationTimer	psf1	psf1		
drx-InactivityTimer	psf1	psf1		
drx-RetransmissionTimer	psf1	psf1		
longDRX-CycleStartOffset	sf80	sf80		
shortDRX	disable	disable		
Note: For further information see clause 6.3.2 in TS 36.331.				

A.7.1.7.2 Test Requirements

For parameters specified in Tables A.7.1.7.1-1 and A.7.1.7.1-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate for Scell in sTAG shall be within the limits defined in clause 7.1.2.

The following sequence of events shall be used to verify that the requirements are met.

For Test 1 and Test 2, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX and DRX with a cycle length of 80 ms:

- a) After the SCell (Cell 2) is activated, the test system shall verify that the UE transmit timing offsets for Scell in sTAG are within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).
- b) The test system adjusts the downlink transmit timing for the activated Scell (Cell 2) by $+64 \times T_S$ (approximately $+2\mu s$) compared to that in (a).
- c) The test system shall verify that for test 1 the adjustment step size and the adjustment rate for Scell in sTAG shall be according to the requirements in clause 7.1.2 until the UE transmit timing offsets of SCell are within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell(Cell 2). Skip this step for test 2.

d) The test system shall verify that the UE transmit timing offsets of the SCell in sTAG stay within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of the activated Scell (Cell 2).

A.7.1.7A E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz

A.7.1.7A.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.7.1.7. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.7.1.7B.1.1-1 will replace the values of corresponding parameters in Tables A.7.1.7.1-1.

Table A.7.1.7A.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for Scell in sTAG for E-UTRAN TDD with 20MHz +20MHz bandwidth

Parameter	Unit	Cell 1		Cell 2	
Parameter	Onit	Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth (BW _{channel})	MHz	20	20	20	20
PDCCH/PCFICH/PHICH					
Reference measurement channel		R.7 TDD	R.7 TDD	R.7 TDD	R.7 TDD
defined in A.3.1.2.2					
OCNG Pattern defined in A.3.2.2		OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD
Io ^{Note1}	dBm/18	-62.5	-62.5	-62.5	-62.5
10	MHz	02.0	02.0	02.0	02.0
Note 1: lo level has been derived	from other	parameters for in	ormation purpose. I	t is not a settable	e parameter.

A.7.1.7A.2 Test Requirements

The test requirements defined in section A.7.1.7.2 shall apply to these test cases.

A.7.1.7B E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz

A.7.1.7B.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.7.1.7. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.7.1.7B.1-1 will replace the values of corresponding parameters in Tables A.7.1.7.1-1.

Table A.7.1.7B.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for Scell in sTAG for E-UTRAN TDD with 20MHz +10MHz bandwidth

Parameter	Unit	С	ell 1	Cell 2	
Parameter	Onit	Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth (BW _{channel})	MHz	20	20	10	10
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.7 TDD	R.7 TDD	R.6 TDD	R.6 TDD
OCNG Pattern defined in A.3.2.2		OP.8 TDD	OP.8 TDD	OP.2 TDD	OP.2 TDD
Io ^{Note1}	dBm/18 MHz	-62.5	-62.5		-
10	dBm/9 MHz	-	-	-65.5	-65.5
Note 1: Io level has been derived	from other	parameters for in	formation purpose. I	t is not a settable	e parameter.

A.7.1.7B.2 Test Requirements

The test requirements defined in section A.7.1.7.2 shall apply to these test cases.

A.7.1.8 Void

A.7.1.8.1 Void

Table A.7.1.8.1-1: Void

A.7.1.8.2 Void

A.7.1.9 Void

A.7.1.8.1 Void

Table A.7.1.9.1-1: Void

A.7.1.8.2 Void

A.7.2 UE Timing Advance

A.7.2.1 E-UTRAN FDD – UE Timing Advance Adjustment Accuracy Test

A.7.2.1.1 Test Purpose and Environment

The purpose of the test is to verify E-UTRAN FDD Timing Advance adjustment accuracy requirements, defined in clause 7.3.2.2, in an AWGN model.

The test parameters are given in tables A.7.2.1.1-1, A.7.2.1.1-2, and A.7.2.1.1-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and Sounding Reference Signals (SRS), as specified in table A.7.2.1.1-3, are sent from the UE and received by the test equipment. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured.

During time period T1, the test equipment shall send one message with a Timing Advance Command MAC Control Element, as specified in Clause 6.1.3.5 in TS 36.321. The Timing Advance Command value shall be set to 31, which according to Clause 4.2.3 in TS 36.213 results in zero adjustment of the Timing Advance. In this way, a reference value for the timing advance used by the UE is established.

During time period T2, the test equipment shall send a sequence of messages with Timing Advance Command MAC Control Elements, with Timing Advance Command value specified in table A.7.2.1.1-2. This value shall result in changes of the timing advance used by the UE, and the accuracy of the change shall then be measured, using the SRS sent from the UE.

As specified in Clause 7.3.2.1, the UE adjusts its uplink timing at sub-frame n+6 for a timing advance command received in sub-frame n. This delay must be taken into account when measuring the timing advance adjustment accuracy, via the SRS sent from the UE.

The UE Time Alignment Timer, described in Clause 5.2 in TS 36.321, shall be configured so that it does not expire in the duration of the test.

Table A.7.2.1.1-1: General Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T _A) value during T2		39	N _{TA} = 128
DRX		OFF	
T1	S	5	
T2	S	5	

Table A.7.2.1.1-2: Cell specific Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test

Parameter	Unit		Value		
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz		10		
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)			OP.1 FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	0			
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note1}	dB				
OCNG_RB ^{Note1}	dB				
Timing Advance Command (T _A)		31	39		
\hat{E}_{s}/I_{ot}	dB		3		
N_{oc}	dBm/15 KHz	-98			
\hat{E}_s/N_{oc}	dB	3			
lo ^{Note2}	dBm/9 MHz		-65.5		
Propagation Condition			AWGN		

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

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Table A.7.2.1.1-3: Sounding Reference Symbol Configuration for E-UTRAN FDD Transmit Timing Accuracy Test

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6	3.3.2 in TS 36.3	31.

A.7.2.1.2 Test Requirements

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub frames after the reception of the timing advance command.

The Timing Advance adjustment accuracy shall be within the limits specified in clause 7.3.2.2.

The rate of correct Timing Advance adjustments observed during repeated tests shall be at least 90%.

A.7.2.2 E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test

A.7.2.2.1 Test Purpose and Environment

The purpose of the test is to verify E-UTRAN TDD Timing Advance adjustment accuracy requirements, defined in clause 7.3.2.2, in an AWGN model.

The test parameters are given in tables A.7.2.2.1-1, A.7.2.2.1-2, and A.7.2.2.1-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and Sounding Reference Signals (SRS), as specified in table A.7.2.2.1-3, are sent from the UE and received by the test equipment. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured.

During time period T1, the test equipment shall send one message with a Timing Advance Command MAC Control Element, as specified in Clause 6.1.3.5 in TS 36.321. The Timing Advance Command value shall be set to 31, which according to Clause 4.2.3 in TS 36.213 results in zero adjustment of the Timing Advance. In this way, a reference value for the timing advance used by the UE is established.

During time period T2, the test equipment shall send a sequence of messages with Timing Advance Command MAC Control Elements, with Timing Advance Command value specified in table A.7.2.1.1-2. This value shall result in changes of the timing advance used by the UE, and the accuracy of the change shall then be measured, using the SRS sent from the UE.

As specified in Clause 7.3.2.1, the UE adjusts its uplink timing at sub-frame n+6 for a timing advance command received in sub-frame n. This delay must be taken into account when measuring the timing advance adjustment accuracy, via the SRS sent from the UE.

The UE Time Alignment Timer, described in Clause 5.2 in TS 36.321, shall be configured so that it does not expire in the duration of the test.

Table A.7.2.2.1-1: General Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Timing Advance Command (<i>T_A</i>) value during T1		31	N _{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (<i>T_A</i>) value during T2		39	N _{TA} = 128
DRX		OFF	
T1	S	5	
T2	S	5	

Table A.7.2.2.1-2: Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value		
		T1	T2	
E-UTRA RF Channel Number		1		
BW _{channel}	MHz		10	
Special subframe configuration Note1			6	
Uplink-downlink configuration Notes			1	
OCNG Patterns defined in A.3.2.2.1			OP.1 TDD	
(OP.1 TDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB		•	
PDCCH_RA	dB	0		
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note3}	dB			
OCNG_RB ^{Note3}	dB			
Timing Advance Command (T _A)		31	39	
\hat{E}_{s}/I_{ot}	dB		3	
N_{oc}	dBm/15 KHz	-98		
\hat{E}_s/N_{oc}	dB		3	
lo ^{Note4}	dBm/9 MHz		-65.5	
Propagation Condition			AWGN	

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.

Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.

Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Table A.7.2.2.1-3: Sounding Reference Symbol Configuration for E-UTRAN TDD Transmit Timing Accuracy Test

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6	3.3.2 in TS 36.3	31.

A.7.2.2.2 Test Requirements

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub frames after the reception of the timing advance command.

The Timing Advance adjustment accuracy shall be within the limits specified in clause 7.3.2.2.

The rate of correct Timing Advance adjustments observed during repeated tests shall be at least 90%.

A.7.2.3 E-UTRAN FDD – UE Timing Advance Adjustment Accuracy Test for 5MHz

A.7.2.3.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.7.2.1.1.

The parameters of this test are the same as defined in Subclause A.7.2.1.1 except that the values of the parameters in the Table A.7.2.3.1-1 will replace the values of the corresponding parameters in A.7.2.1.1-1, table A.7.2.3.1-2 will replace the values of the corresponding parameters in A.7.2.1.1-2. Parameters used for the sounding reference symbol configuration are unchanged from table A.7.2.1.1-3.

Table A.7.2.3.1-1: General Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test for 5MHz bandwidth

	Parameter	Unit	Value	Comment		
PDS	CH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.3.1.1.1		
	H/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.3.1.2.1		
Note 1:	Note 1: For the reference measurement channels, see clause A.3.1.					
Note 2:	Note 2: See Table A.7.2.1.1-1 for the other parameters.					
Note 3:	·					

Table A.7.2.3.1-2: Cell specific Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test for 5MHz bandwidth

Parameter	Unit	Value		
		T1	T2	
BW _{channel}	MHz		5	
OCNG Patterns defined in			OP.15 FDD	
A.3.2.1.15 (OP.15 FDD)				
lo ^{Note2}	dBm/4.5		-68.5	
10	MHz			
Note 1: For the reference measurement channels, see clause A.3.2.				
Note 2: See Table A.7.2.1.1-2 for the other parameters.				

A.7.2.3.2 Test Requirements

The test requirements defined in section A.7.2.1.2 shall apply to this test case.

A.7.2.4 E-UTRAN FDD – UE Timing Advance Adjustment Accuracy Test for SCell in sTAG

A.7.2.4.1 Test Purpose and Environment

The purpose of the test is to verify E-UTRAN FDD Timing Advance adjustment accuracy requirements, defined in clause 7.3.2.2, in an AWGN model.

The test parameters are given in tables A.7.2.4.1-1, A.7.2.4.1-2, and A.7.2.4.1-3. For this test two cells are used. Cell 1 is PCell and Cell 2 is SCell. PCell is in the primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands for sTAG are sent to the UE and Sounding Reference Signals (SRS), as specified in table A.7.2.4.1-3, are sent from the UE and received by the test equipment. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured for SCell in sTAG.

During time period T1, the test equipment shall send one message with a Timing Advance Command MAC Control Element for sTAG, as specified in Clause 6.1.3.5 in TS 36.321. The Timing Advance Command value shall be set to 31, which according to Clause 4.2.3 in TS 36.213 results in zero adjustment of the Timing Advance. In this way, a reference value for the timing advance for sTAG used by the UE is established.

During time period T2, the test equipment shall send a sequence of messages with Timing Advance Command MAC Control Elements for sTAG, with Timing Advance Command value specified in table A.7.2.4.1-2. This value shall result in changes of the timing advance for sTAG used by the UE, and the accuracy of the change shall then be measured, using the SRS sent from the UE.

As specified in Clause 7.3.2.1, the UE adjusts its uplink timing at sub-frame n+6 for a timing advance command received in sub-frame n. This delay must be taken into account when measuring the timing advance adjustment accuracy, via the SRS sent from the UE.

The UE Time Alignment Timer, described in Clause 5.2 in TS 36.321, shall be configured so that it does not expire in the duration of the test.

Table A.7.2.4.1-1: General Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test for SCell in sTAG

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T _A) value during T2		39	N _{TA} = 128
DRX		OFF	
T1	S	5	
T2	S	5	

Table A.7.2.4.1-2: Cell specific Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test for SCell in sTAG

Parameter	Unit	Value				
	Ī	Cell1			Cell2	
	Ī	T1	T2	T1		T2
E-UTRA RF Channel			1		2	
Number						
BW _{channel}	MHz		10		10	
Active PCell		Cell1	Cell1			
Active SCell				Cell2		Cell2
TAG configuration		pTAG	pTAG	sTAG		sTAG
OCNG Patterns defined		(OP.1 FDD		OP.1 FE	DD
in A.3.2.1.1 (OP.1 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB				0	
PDCCH_RA	dB		0			
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note1}	dB					
OCNG_RB ^{Note1}	dB					
Timing Advance		/	/	31		39
Command (T_A)						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	3			3	
N_{oc}	dBm/15 KHz	-98			-98	
\hat{E}_s/N_{oc}	dB	3			3	
Io ^{Note2}	dBm/9 MHz	-65.5			-65.5	
Propagation Condition			AWGN			I
N (4 00NO 1 III			(11 11 4 1		1	

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

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Table A.7.2.4.1-3: Sounding Reference Symbol Configuration for E-UTRAN FDD Transmit Timing Accuracy Test for SCell in sTAG

Field	Value	Comment		
srsBandwidthConfiguration	bw5			
srsSubframeConfiguration	sc3	Once every 5 subframes		
ackNackSrsSimultaneousTransmission	FALSE			
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD		
srsBandwidth	0	No hopping		
srsHoppingBandwidth	hbw0			
frequencyDomainPosition	0			
Duration	TRUE	Indefinite duration		
Srs-ConfigurationIndex	7	SRS periodicity of 10.		
transmissionComb	0			
cyclicShift	cs0	No cyclic shift		
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission		
Note: For further information see clause 6.3.2 in TS 36.331.				

A.7.2.4.2 Test Requirements

The UE shall apply the signalled Timing Advance value for SCell in sTAG to the transmission timing at the designated activation time i.e. 6 sub frames after the reception of the timing advance command.

The Timing Advance adjustment accuracy for SCell in STAG shall be within the limits specified in clause 7.3.2.2.

The rate of correct Timing Advance adjustments observed during repeated tests shall be at least 90%.

A.7.2.5 E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test for Scell in sTAG

A.7.2.5.1 Test Purpose and Environment

The purpose of the test is to verify E-UTRAN TDD Timing Advance adjustment accuracy requirements, defined in clause 7.3.2.2, in an AWGN model.

The test parameters are given in tables A.7.2.5.1-1, A.7.2.5.1-2, and A.7.2.5.1-3. For this test two cells are used. Cell 1 is PCell and Cell 2 is SCell. PCell is in the primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands for sTAG are sent to the UE and Sounding Reference Signals (SRS), as specified in table A.7.2.5.1-3, are sent from the UE and received by the test equipment, but only for SCell. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured for SCell in sTAG.

During time period T1, the test equipment shall send one message with a Timing Advance Command MAC Control Element for sTAG, as specified in Clause 6.1.3.5 in TS 36.321. The Timing Advance Command value shall be set to 31, which according to Clause 4.2.3 in TS 36.213 results in zero adjustment of the Timing Advance. In this way, a reference value for the timing advance used by the UE is established.

During time period T2, the test equipment shall send a sequence of messages with Timing Advance Command MAC Control Elements for sTAG, with Timing Advance Command value specified in table A.7.2.5.1-2. This value shall result in changes of the timing advance on SCell used by the UE, and the accuracy of the change shall then be measured, using the SRS sent from the UE.

As specified in Clause 7.3.2.1, the UE adjusts its uplink timing at sub-frame n+6 for a timing advance command received in sub-frame n. This delay must be taken into account when measuring the timing advance adjustment accuracy, via the SRS sent from the UE.

The UE Time Alignment Timer, described in Clause 5.2 in TS 36.321, shall be configured so that it does not expire in the duration of the test.

Table A.7.2.5.1-1: General Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test for SCell in sTAG

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Timing Advance Command (T _A) value during T1		31	N _{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (<i>T_A</i>) value during T2		39	N _{TA} = 128
DRX		OFF	
T1	S	5	
T2	S	5	

Table A.7.2.5.1-2: Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test for SCell in sTAG

Parameter	Unit	V	alue
		Cell 1	Cell 2
		T1 T2	T1 T2
E-UTRA RF Channel Number		1	2
BW _{channel}	MHz	10	10
Active PCell		Cell1	
Active SCell			Cell2
TAG configuration		pTAG	sTAG
Special subframe configuration Note1		6	6
Uplink-downlink configuration Note2		1	1
OCNG Patterns defined in A.3.2.2.1		OP.1 TDD	OP.1 TDD
(OP.1 TDD)		OF.1 TDD	OF.1 1DD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note3}	dB		
OCNG_RB ^{Note3}	dB		
Timing Advance Command (T _A)			31 39
\hat{E}_{s}/I_{ot}	dB	3	3
N_{oc}	dBm/15 KHz	-98	-98
\hat{E}_s/N_{oc}	dB	3	3
Io ^{Note4}	dBm/9 MHz	-65.5	-65.5
Propagation Condition		AWGN	AWGN
-			

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.

Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.

Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Table A.7.2.5.1-3: Sounding Reference Symbol Configuration for E-UTRAN TDD Transmit Timing Accuracy Test for SCell in sTAG

Field	Value	Comment			
srsBandwidthConfiguration	bw5				
srsSubframeConfiguration	sc3	Once every 5 subframes			
ackNackSrsSimultaneousTransmission	FALSE				
srsMaxUpPTS	N/A				
srsBandwidth	bw0	No hopping			
srsHoppingBandwidth	hbw0				
frequencyDomainPosition	0				
Duration	TRUE	Indefinite duration			
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.			
transmissionComb	0				
cyclicShift	cs0	No cyclic shift			
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission			
Note: For further information see clause 6.3.2 in TS 36.331.					

A.7.2.5.2 Test Requirements

The UE shall apply the signalled Timing Advance value for SCell in sTAG to the transmission timing at the designated activation time i.e. 6 sub frames after the reception of the timing advance command.

The Timing Advance adjustment accuracy for SCell in sTAG shall be within the limits specified in clause 7.3.2.2.

The rate of correct Timing Advance adjustments observed during repeated tests shall be at least 90%.

A.7.2.5A E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test for Scell in sTAG for 20 MHz +20 MHz

A.7.2.5A.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.7.2.5.1.

The parameters of this test are the same as defined in Subclause A.7.2.5.1 except that the values of the parameters in the Table A.7.2.5A.1-1 will replace the values of the corresponding parameters in A.7.2.5.1-1, table A.7.2.5A.1-2 will replace the values of the corresponding parameters in A.7.2.5.1-2. Parameters used for the sounding reference symbol configuration are unchanged from table A.7.2.5.1-3.

Table A.7.2.5A.1-1: General Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test for SCell in sTAG for 20 MHz +20 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2
parameters		Channel R.10 TDD	

Table A.7.2.5A.1-2: Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test for SCell in sTAG for 20 MHz +20 MHz

Parameter	Unit	Value					
		Cell	1	Cell 2			
		T1 T2		T1	T2		
BW _{channel}	MHz	20		20			
OCNG Patterns defined in A.3.2.2		OP.7 TDD		OP.7 TDD			
lo ^{Note4}	dBm/18 MHz	-62.	5	-62.5			

A.7.2.5A.2 Test Requirements

The test requirements defined in section A.7.2.5.2 shall apply to this test case.

A.7.2.5B E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test for Scell in sTAG for 20 MHz +10 MHz

A.7.2.5B.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.7.2.5.1.

The parameters of this test are the same as defined in Subclause A.7.2.5.1 except that the values of the parameters in the Table A.7.2.5B.1-1 will replace the values of the corresponding parameters in A.7.2.5.1-1, table A.7.2.5B.1-2 will replace the values of the corresponding parameters in A.7.2.5.1-2. Parameters used for the sounding reference symbol configuration are unchanged from table A.7.2.5.1-3.

Table A.7.2.5B.1-1: General Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test for SCell in sTAG for 20 MHz +10 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		For Cell 1: DL Reference	As specified in clause A.3.1.1.2
		Measurement Channel R.3 TDD	
		For Cell 2: DL Reference	
		Measurement Channel R.0 TDD	
PCFICH/PDCCH/PHICH		For Cell 1: DL Reference	As specified in clause A.3.1.2.2
parameters		Measurement Channel R.10 TDD	
		For Cell 2: DL Reference	
		Measurement Channel R.6 TDD	

Table A.7.2.5B.1-2: Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test for SCell in sTAG for 20 MHz +10 MHz

Parameter	Unit		Val	ue	9		
		Cel	l 1	Ce	II 2		
		T1	T2	T1	T2		
BW _{channel}	MHz	20)	10			
OCNG Patterns defined in A.3.2.2		OP.7	TDD	OP.1	TDD		
lo ^{Note4}	dBm/18 MHz	-62	.5	N/A			
10	dBm/9 MHz	N/A	A	-65.5			

A.7.2.5B.2 Test Requirements

The test requirements defined in section A.7.2.5.2 shall apply to this test case.

A.7.3 Radio Link Monitoring

In the following section, any uplink signal transmitted by the UE is used for detecting the In-/Out-of-Sync state of the UE. In terms of measurement, the uplink signal is verified on the basis of the UE output power:

For intra-band contiguous carrier aggregation, transmit OFF power is measured as the mean power per component carrier.

For UE with multiple transmit antennas, transmit OFF power is measured as the mean power at each transmit connector.

- UE output power higher than Transmit OFF power -50 dBm (as defined in TS 36.101 [5]) means uplink signal
- UE output power equal to or less than Transmit OFF power -50 dBm (as defined in TS 36.101 [5]) means no uplink signal.

A.7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

A.7.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.1.1-1, A.7.3.1.1-2 and A.7.3.1.1-3 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.1.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Table A.7.3.1.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

Pai	rameter	Unit		Va	lue		Comment	
			Test 1	Test 2	Test 3	Test 4		
PCFICH/PDC parameters	CH/PHICH		R.6 FDD	R.7 FDD	R.6 FDD	R.7 FDD	As specified in section A.3.1.2.1. None of the PDCCH are intended for the UE under test	
OCNG param	eters		OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	As specified in section A.3.2.1.2.	
Active cell	Active cell		Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1	
CP length	CP length		Normal	Normal	Normal	Normal		
E-UTRA RF C	channel Number		1	1	1	1	One E-UTRA FDD carrier frequency is used.	
E-UTRA Char (BW _{channel})	nnel Bandwidth	MHz	10	10	10	10		
	Correlation Matrix and Antenna		1x2	2x2	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2	
Out of sync	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.3 in TS 36.212	
transmission parameters (Note 1)	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Qout and the corresponding	
	Aggregation level	CCE	8	8	8	8	hypothetical PDCCH/PCFICH	
	ρ _A , ρ _B		0	-3	0	-3	transmission	
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	parameters are as specified in section	
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	7.6.1 and Table 7.6.1-1 respectively.	
DRX			OFF	OFF	OFF	OFF		
Layer 3 filterin	ıg		Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1	
T310 timer		ms	0	0	0	0	T310 is disabled	
T311 timer		ms	1000	1000	1000	1000	T311 is enabled	
	reporting mode		PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.	
CQI reporting	CQI reporting periodicity		2	2	2	2	Minimum CQI reporting periodicity	
Propagation of	Propagation channel		AWGN	AWGN	ETU 70 Hz	ETU 70 Hz		
T1		S	1	1	1	1		
T2		S	0.4	0.4	0.4	0.4		
T3		S	0.5	0.5	0.5	0.5		
Note 4: DD	COLUDOFICIA SAMA				_!		a for all colors of the Alexander	

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.1.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit		Test 1			Test 2		
		T1	T2	Т3	T1	T2	Т3	
E-UTRA RF Channel			1			1		
Number								
BW _{channel}	MHz		10			10		
Antenna			1x2		2x2			
Configuration								
OCNG Pattern								
defined in A.3.2.1			OP.2 FDD			OP.2 FDD		
(FDD)								
ρ_{A},ρ_{B}			0		-3			
PCFICH_RB	dB		4		1			
PDCCH_RA	dB		4			1		
PDCCH_RB	dB		4			1		
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PHICH_RA	dB		0			-3		
PHICH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG RB ^{Note 1}	dB							
SNR Note 6	dB	-4.7	-9.5	-13.5	-4.7	-9.5	-13.5	
N_{oc}	dBm/15						•	
¹ 'oc	kHz							
Propagation condition		AWGN AWGN						

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal
- Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.1.1-1.

Table A.7.3.1.1-3: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit		Test 3		Test 4			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1			1		
Number								
BW _{channel}	MHz		10		10			
Correlation Matrix			1x2 Low		2x2 Low			
and Antenna								
Configuration								
OCNG Pattern								
defined in A.3.2.1			OP.2 FDD			OP.2 FDD		
(FDD)								
ρ _A , ρ _B			0		-3			
PCFICH_RB	dB		4			11		
PDCCH_RA	dB	4				1		
PDCCH_RB	dB		4			1		
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PHICH_RA	dB		0			-3		
PHICH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG RB ^{Note 1}	dB							
SNR Note 6	dB	-1.4	-5.5	-11.5	-2.3	-6.2	-12.2	
N_{oc}	dBm/15	-98			-98			
1 oc	kHz							
Propagation condition			ETU 70 Hz			ETU 70 Hz		

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal
- Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.1.1-1.

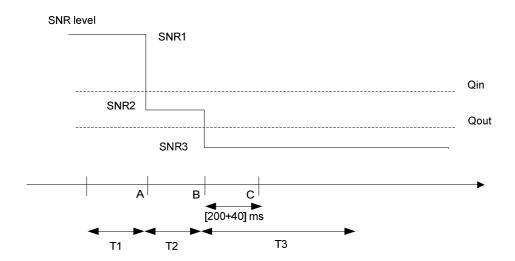


Figure A.7.3.1.1-1 SNR variation for out-of-sync testing

A.7.3.1.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

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

A.7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync

A.7.3.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.2.1-1 and A.7.3.2.1-2 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.2.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Table A.7.3.2.1-1: General test parameters for E-UTRAN FDD in-sync testing

Pa	rameter	Unit	Va	lue	Comment
			Test 1	Test 2	
PCFICH/PDC0 parameters	CH/PHICH		R.6 FDD	R.7 FDD	As specified in clause A.3.1.2.1. None of the PDCCH are intended for the UE under test
OCNG parame	eters		OP.2 FDD	OP.2 FDD	As specified in clause A.3.2.1.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF	Channel Number		1	1	One E-UTRA FDD carrier frequency is used.
	E-UTRA Channel Bandwidth (BW _{channel})		10	10	
	Correlation Matrix and Antenna Configuration		1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
In sync transmissio	DCI format		1C	1C	As defined in clause 5.3.3.1.4 in TS 36.212
n parameters (Note 1)	Number of Control OFDM symbols		2	2	In sync threshold Q _{in} and the corresponding hypothetical
(11010-1)	Aggregation level	CCE	4	4	PDCCH/PCFICH transmission parameters
	ρ _Α , ρ _Β		0	-3	are as specified in clause and Table 7.6.1-2 respectively.
	Ratio of PDCCH to RS EPRE		0	-3	
	Ratio of PCFICH to RS EPRE		4	1	
Out of sync transmissio	DCI format		1A	1A	As defined in clause 5.3.3.1.3 in TS 36.212
n parameters (Note 1)	Number of Control OFDM symbols		2	2	Out of sync threshold Q _{out} and the corresponding hypothetical
(1000)	Aggregation level	CCE	8	8	PDCCH/PCFICH transmission parameters
	ρ _Α , ρ _Β		0	-3	are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.
	Ratio of PDCCH to RS EPRE	dB	4	1	·
	Ratio of PCFICH to RS EPRE	dB	4	1	
	DRX		OFF	OFF	
Layer 3 filtering)	m	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	2000	T310 is enabled

T311 timer	ms	1000	1000	T311 is enabled
Periodic CQI reporting mode		PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	2	2	Minimum CQI reporting periodicity
Propagation channel		ETU 70 Hz	ETU 70 Hz	
T1	S	0.5	0.5	
T2	S	0.4	0.4	
Т3	S	1.46	1.46	
T4	S	0.4	0.4	
T5	S	1	1	
Note 1: PDCCH/PCFICH corr	espondi	na to the in-sy	nc and out of	sync transmission

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.2.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1						Test	2			
		T1	T2	T3 T	4	T5	T1	T2	T3	T4		T5
E-UTRA RF Channel				1					1			
Number												
BW _{channel}	MHz			10			10					
Correlation Matrix		1x2 Low						2x2 L	ow			
and Antenna												
Configuration												
OCNG Pattern			00.0 500									
defined in A.3.2.1		OP.2 FDD			OP.2 FDD							
(FDD)												
ρ_{A},ρ_{B}		0				-3						
PCFICH_RB	dB	4					1					
PDCCH_RA	dB			0					-3			
PDCCH_RB	dB			0			-3					
PBCH_RA	dB			`								
PBCH_RB	dB											
PSS_RA	dB											
SSS_RA	dB											
PHICH_RA	dB			0					-3			
PHICH_RB	dB											
PDSCH_RA	dB											
PDSCH_RB	dB											
OCNG_RA ^{Note 1}	dB											
OCNG_RB ^{Note 1}	dB											
SNR Note 6	dB	-1.4	-5.5	-11.5	-6.4	-1.4	-2.3	-6.2	-12.	2 -7	7.3	-2.3
N_{oc}	dBm/15	-98	•	•	•	•	-98	•	•			
1 oc	kHz											
Propagation condition		ETU 7	0 Hz				ETU 7	0 Hz				

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.2.1-1.

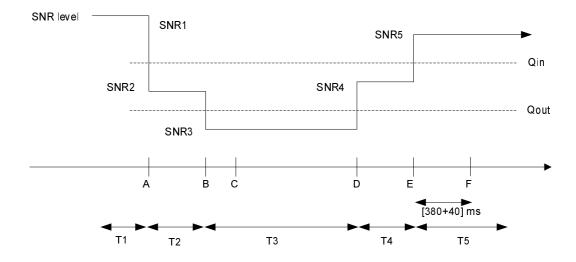


Figure A.7.3.2.1-1 SNR variation for in-sync testing

A.7.3.2.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

A.7.3.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.3.1-1, A.7.3.3.1-2 and A.7.3.3.1-3 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.3.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Table A.7.3.3.1-1: General test parameters for E-UTRAN TDD out-of-sync testing

Pa	rameter	Unit		Va	lue		Comment
			Test 1	Test 2	Test 3	Test 4	1
PCFICH/PDC parameters	CCH/PHICH		R.6 TDD	R.7 TDD	R.6 TDD	R.7 TDD	As specified in clause A.3.1.2.2. None of the PDCCH are intended for the UE under test
OCNG paran	neters		OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	As specified in clause A.3.2.2.2.
Active cell	Active cell		Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length	CP length		Normal	Normal	Normal	Normal	
E-UTRA RF	Channel Number		1	1	1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Cha (BW _{channel})	nnel Bandwidth	MHz	10	10	10	10	
	flatrix and Antenna		1x2	2x2	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
Out of sync	DCI format		1A	1A	1A	1A	As defined in clause 5.3.3.1.3 in TS 36.212
transmissio n parameters	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Qout and the corresponding
(Note 1)	Aggregation level	CCE	8	8	8	8	hypothetical PDCCH/PCFICH
	ρ _A , ρ _B		0	-3	0	-3	transmission
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	parameters are as specified in
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	clause 7.6.1 and Table 7.6.1-1 respectively.
DRX			OFF	OFF	OFF	OFF	
Layer 3 filteri	ng		Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	0	0	T310 is disabled
T311 timer		ms	1000	1000	1000	1000	T311 is enabled
	reporting mode		PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting	g periodicity	ms	1	1	1	1	Minimum CQI reporting periodicity
Propagation	channel		AWGN	AWGN	ETU 70 Hz	ETU 70 Hz	
T1		S	1	1	1	1	
T2		S	0.4	0.4	0.4	0.4	
T3		S	0.5	0.5	0.5	0.5	
Nata 4. DE	OCCU/DOFICU	1:					to a fine alternational for Alexander

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.3.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit		Test 1			Test 2				
		T1	T2	T3	T1	T2	T3			
E-UTRA RF Channel			1	•		1	•			
Number										
BW _{channel}	MHz		10			10				
Antenna			1x2		2x2					
Configuration										
Special subframe		6				6				
configuration Note1										
Uplink-downlink			1		1					
configuration Note2										
OCNG Pattern										
defined in A.3.2.2			OP.2 TDD		OP.2 TDD					
(TDD)										
ρ_A , ρ_B			0			-3				
PCFICH_RB	dB		4			1				
PDCCH_RA	dB		4			1				
PDCCH_RB	dB		4		1					
PBCH_RA	dB									
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PHICH_RA	dB		0			-3				
PHICH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA ^{Note 3}	dB									
OCNG_RB ^{Note 3}	dB									
SNR Note 8	dB	-5.1	-9.1	-13.1	-5.2	-9.2	-13.2			
N_{oc}	dBm/15	-98 -98								
	kHz									
Propagation condition			AWGN			AWGN AWGN				

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.3.1-1.

Table A.7.3.3.1-3: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit		Test 3			Test 4			
		T1	T2	T3	T1	T2	T3		
E-UTRA RF Channel			1			1			
Number									
BW _{channel}	MHz		10		10				
Correlation Matrix			1x2 Low			2x2 Low			
and Antenna									
Configuration									
Special subframe		6			6				
configuration Note1									
Uplink-downlink			1		1				
configuration Note2									
OCNG Pattern									
defined in A.3.2.2			OP.2 TDD		OP.2 TDD				
(TDD)									
ра, рв			0			-3			
PCFICH_RB	dB		4		1				
PDCCH_RA	dB		4		1				
PDCCH_RB	dB		4		1				
PBCH_RA	dB								
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB		_			_			
PHICH_RA	dB		0			-3			
PHICH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA ^{Note 3}	dB								
LOCNG RB ^{NOTE 3}	dB								
SNR Note 8	dB	-1.4	-5.3	-11.3	-2.3	-5.9	-11.9		
N_{oc}	dBm/15	15 -98 -98							
	kHz								
Propagation condition		ETU 70	Hz		ETU 70 I	Hz			

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal RFs.
- Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.3.1-1.

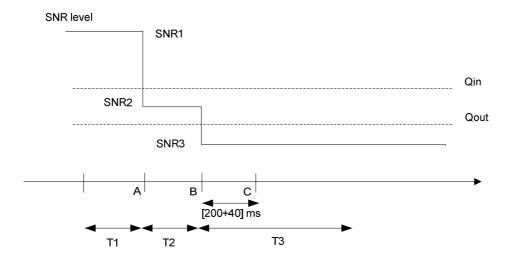


Figure A.7.3.3.1-1. SNR variation for out-of-sync testing

A.7.3.3.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of the time duration T3).

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

A.7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync

A.7.3.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.4.1-1 and A.7.3.4.1-2 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.4.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Table A.7.3.4.1-1: General test parameters for E-UTRAN TDD in-sync testing

Pa	Parameter Unit Value		Comment		
			Test 1	Test 2	
PCFICH/PDC0 parameters	CH/PHICH		R.6 TDD	R.7 TDD	As specified in clause A.3.1.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	As specified in clause A.3.2.2.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF	Channel Number		1	1	One E-UTRA FDD carrier frequency is used.
	nannel Bandwidth W _{channel})	MHz	10	10	
	Matrix and Antenna figuration		1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
In sync transmissio	DCI format		1C	1C	As defined in clause 5.3.3.1.4 in TS 36.212
n parameters (Note 1)	Number of Control OFDM symbols		2	2	In sync threshold Q _{in} and the corresponding hypothetical
(1000)	Aggregation level	CCE	4	4	PDCCH/PCFICH transmission parameters
	ρ _Α , ρ _Β		0	-3	are as specified in clause and Table 7.6.1-2 respectively.
	Ratio of PDCCH to RS EPRE		0	-3	
	Ratio of PCFICH to RS EPRE		4	1	
Out of sync transmissio	DCI format		1A	1A	As defined in clause 5.3.3.1.3 in TS 36.212
n parameters (Note 1)	Number of Control OFDM symbols		2	2	Out of sync threshold Q _{out} and the corresponding hypothetical
(11010 1)	Aggregation level	CCE	8	8	PDCCH/PCFICH transmission parameters
	ρ _Α , ρ _Β		0	-3	are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.
	Ratio of PDCCH to RS EPRE	dB	4	1	, ,
	Ratio of PCFICH to RS EPRE	dB	4	1	
	DRX		OFF	OFF	
Layer 3 filtering)	m	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	2000	T310 is enabled

T311 timer	ms	1000	1000	T311 is enabled
Periodic CQI reporting mode		PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	1	1	Minimum CQI reporting periodicity
Propagation channel		ETU 70 Hz	ETU 70 Hz	
T1	S	0.5	0.5	
T2	S	0.4	0.4	
Т3	s	1.46	1.46	
T4	S	0.4	0.4	
T5	s	1	1	
Note 1: PDCCH/PCFICH corr	espondi	na to the in-sy	nc and out of	sync transmission

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.4.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1						Tes	st 2		
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel				,	1					1	
Number											
BW _{channel}	MHz			1	0				1	0	
Correlation Matrix				1x2	Low				2x2	Low	
and Antenna											
Configuration											
Special subframe configuration Note1				6	6				(6	
Uplink-downlink				•	1					1	
configuration Note2											
OCNG Pattern											
defined in A.3.2.2				OP.2	TDD				OP.2	TDD	
(TDD)											
ρΑ, ρΒ		0 -3				3					
PCFICH_RB	dB				1			1			
PDCCH_RA	dB)			-3			
PDCCH_RB	dB			()				-	3	
PBCH_RA	dB			`							
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB			()				-	3	
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB	,									
OCNG_RA ^{Note 3}	dB										
OCNG_RB ^{Note 3}	dB										

SNR Note	8	dB	-1.4	-5.3	-11.3	-6.4	-1.4	-2.3	-5.9	-11.9	-7.3	-2.3
N_{oc}		dBm/15 kHz	-98					-98				
Propagat	ion condition		ETU 7	0 Hz				ETU 7	0 Hz			
Note 1:	For the spec	ial subframe c	onfigura	tion see	table 4.2	2-1 in TS	36.211					
Note 2:	For the uplin	k-downlink cor	nfiguration	on see ta	able 4.2-	2 in TS 3	36.211.					
Note 3:	OCNG shall	be used such	that the resources in cell # 1 are fully allocated and a constant total transmitted									
	power spectr	ral density is a	chieved	for all O	FDM syr	nbols.						
Note 4:	The uplink re	esources for C	QI repor	ting are	assigned	to the l	JE prior	to the st	art of tin	ne period	1T1.	
Note 5:	The timers a	nd layer 3 filte	ring rela	ted para	meters a	re confi	gured pr	ior to the	e start of	time per	riod T1.	
Note 6:	The signal co	ontains PDCCH for UEs other than the device under test as part of OCNG.										
Note 7:	SNR levels of	correspond to t	the signal to noise ratio over the cell-specific reference signal REs.									
Note 8:		time periods T	ds T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5									

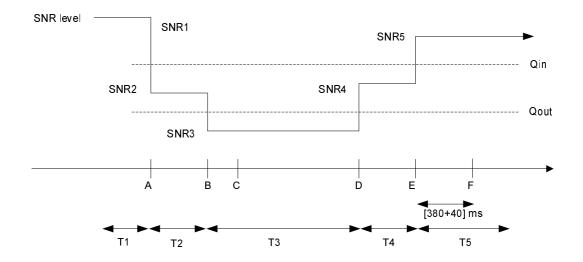


Figure A.7.3.4.1-1. SNR variation for in-sync testing

A.7.3.4.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

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

A.7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

A.7.3.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.5.1-1, A.7.3.5.1-2, A.7.3.5.1-3 and A.7.3.5.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.5.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send

periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.5.1-1: General test parameters for E-UTRAN FDD out-of-sync tests in DRX

Para	meter	Unit	Val		Comment
			Test 1	Test 2	
PCFICH/PDC0 parameters	PCFICH/PDCCH/PHICH parameters		R.7 FDD	R.6 FDD	As specified in clause A.3.1.2.1. None of the PDCCH are intended for the UE under test
OCNG parame	eters		OP.2 FDD	OP.2 FDD	As specified in clause A.3.2.1.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
	hannel Number		1	1	One E-UTRA FDD carrier frequency is used.
(BWchannel)	nel Bandwidth	MHz	10	10	
Correlation Ma Antenna Confi			2x2 Low	1x2	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
Out of sync	DCI format		1A	1A	As defined in clause 5.3.3.1.3 in TS 36.212
transmission parameters (Note 1)	Number of Control OFDM symbols		2	2	Out of sync threshold Qout and the corresponding hypothetical
,	Aggregation level	CCE	8	8	PDCCH/PCFICH transmission parameters
	ρΑ, ρΒ		-3	0	are as specified in
	Ratio of PDCCH to RS EPRE	dB	1	4	clause 7.6.1 and Table 7.6.1-1 respectively.
	Ratio of PCFICH to RS EPRE	dB	1	4	
DRX cycle		ms	40	1280	See Table A.7.3.5.1-3
Layer 3 filterin	g		Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	T310 is disabled
T311 timer		ms	1000	1000	T311 is enabled
	reporting mode		PUCCH 1-0	PUCCH 1- 0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting		ms	2	2	Minimum CQI reporting periodicity
Propagation c	hannel		ETU 70 Hz	AWGN	
T1		S	4	32	
T2		S	1.6	12.8	
T3		S	1.8	13	

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.5.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2 in DRX

Parameter	Unit		Test 1			Test 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10		10		
Correlation Matrix			2x2 Low			1x2	
and Antenna							
Configuration							
OCNG Pattern			00 0 500			00 0 500	
defined in A.3.2.1			OP.2 FDD			OP.2 FDD	
(FDD)							
ρ _A , ρ _B			-3			0	
PCFICH_RB	dB		1			4	
PDCCH_RA	dB		1			4	
PDCCH_RB	dB		1		4		
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB		-3		0		
PHICH_RA	dB		-		· ·		
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note1}	dB						
OCNG_RB ^{Note1}	dB						
SNR Note 6	dB	-2.3	-6.2	-12.2	-4.7	-9.5	-13.5
N_{oc}	dBm/15 kHz	-98 -98					
Propagation condition		ETU 70 Hz AWGN					
		n that the resources in cell # 1 are fully allocated and a constant					
		pectral density is achieved for all OFDM symbols. CQI reporting are assigned to the UE prior to the start of time					
	nd layer 3 filter	ing related	l paramete	rs are confi	gured prio	r to the sta	rt of time

- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- SNR levels correspond to the signal to noise ratio over the cell-specific reference signal Note 5: REs.
- The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 Note 6: respectively in figure A.7.3.5.1-1.

Table A.7.3.5.1-3: DRX-Configuration for E-UTRAN FDD out-of-sync tests

Field	Test1	Test2	Comment
Field	Value	Value	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.7.3.5.1-4: TimeAlignmentTimer - Configuration for E-UTRAN FDD out-of-sync testing

Field	Test1	Test2	Comment
rieid	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

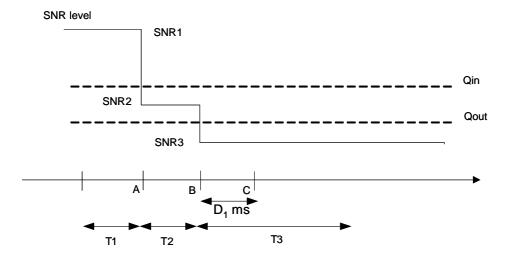


Figure A.7.3.5.1-1 SNR variation for out-of-sync testing in DRX

A.7.3.5.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In test 1 and test 2 during the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

In test 1 the UE shall stop transmitting uplink signal no later than time point C (duration $D_1 = 900$ ms after the start of time duration T3).

In test 2 the UE shall stop transmitting uplink signal no later than time point C (duration $D_1 = 6500$ ms after the start of time duration T3.

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

A.7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

A.7.3.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.6.1-1, A.7.3.6.1-2, A.7.3.6.1-3 and A.7.3.6.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.6.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.6.1-1: General test parameters for E-UTRAN FDD in-sync test in DRX

Parar	meter	Unit	Value	Comment		
PCFICH/PDCCH/P	PCFICH/PDCCH/PHICH parameters		R.6 FDD	As specified in clause A.3.1.2.1. None of the PDCCH are intended for the UE under test		
OCNG parameters			OP.2 FDD	As specified in clause A.3.2.1.2.		
Active cell			Cell 1	Cell 1 is on E-UTRA RF		
CP length			Normal	channel number 1		
E-UTRA RF Chann	el Number		1 1	One E-UTRA FDD carrier		
			·	frequency is used.		
E-UTRA Channel B	andwidth	MHz	10			
(BW _{channel}) Antenna Configurat	ion		1x2			
Antenna Comigura	DCI format		1X2 1C	As defined in clause 5.3.3.1.4 in		
	Dorionnat		10	TS 36.212		
In sync transmission parameters	Number of Control OFDM symbols		2	In sync threshold Q _{in} and the corresponding hypothetical PDCCH/PCFICH transmission		
(Note 1)	Aggregation level	CC E	4	parameters are as specified in clause and Table 7.6.1-2		
	ρΑ, ρΒ		0	respectively.		
	Ratio of PDCCH to RS EPRE		0			
	Ratio of PCFICH to RS EPRE		4			
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212		
Out of sync transmission parameters	Number of Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission		
(Note 1)	Aggregation level	CC E	8	parameters are as specified in clause 7.6.1 and Table 7.6.1-1		
	ρ _A , ρ _B		0	respectively.		
	Ratio of PDCCH to RS EPRE	dB	4			
	Ratio of PCFICH to RS EPRE	dB	4			
DRX cycle		ms	40	See Table A.7.3.6.1-3		
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1		
T310 timer		ms	2000	T310 is enabled		
T311 timer		ms	1000	T311 is enabled		
Periodic CQI reporting mode			PUCCH 1- 0	As defined in table 7.2.2-1 in TS 36.213.		
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity		
Propagation channel			AWGN			
T1		S	4			
T2		S	1.6			
T3		S	1.46			
T4		S	0.4			
T5 s 4 Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission						

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.6.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring test # 1 in DRX

Parameter	Unit	Test 1						
		T1	T2	T3	T4	T5		
E-UTRA RF Channel Number				1				
BW _{channel}	MHz			10				
Antenna Configuration				1x2				
OCNG Pattern defined in								
A.3.2.1 (FDD)				OP.2 FDD				
ρ _A , ρ _B				0				
PCFICH_RB	dB			4				
PDCCH_RA	dB	·	<u>-</u>	0	<u>-</u>			
PDCCH_RB	dB			0				
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PHICH_RA	dB			0				
PHICH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note1}	dB							
OCNG RB ^{Note1}	dB							
SNR Note 8	dB	-4.7	-9.5	-13.5	-8.7	-4.7		
N_{oc}	dBm/15		•	-98	•	•		
1 voc	kHz							
Propagation condition		AWGN						
Note 1: OCNG shall be used	such that the	at the resources in cell # 1 are fully allocated and a constant total						

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.6.1-1.

Table A.7.3.6.1-3: DRX-Configuration for E-UTRAN FDD out-of-sync tests

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table A.7.3.6.1-4: TimeAlignmentTimer -Configuration for E-UTRAN FDD out-of-sync testing

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

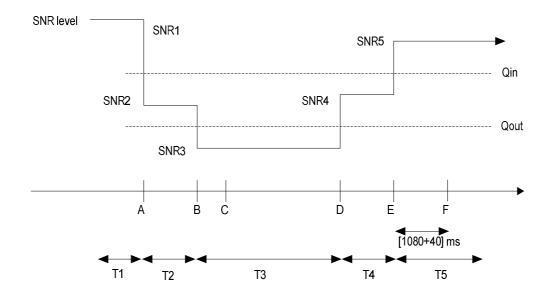


Figure A.7.3.6.1-1 SNR variation for in-sync testing in DRX

A.7.3.6.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

A.7.3.7.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.7.1-1, A.7.3.7.1-2, A.7.3.7.1-3 and A.7.3.7.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.7.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.7.1-1: General test parameters for E-UTRAN TDD out-of-sync tests in DRX

Parameter		Unit	Val		Comment	
			Test 1	Test 2		
PCFICH/PDC parameters	CH/PHICH		R.7 TDD	R.6 TDD	As specified in clause A.3.1.2.2. None of the PDCCH are intended for the UE under test	
OCNG param	eters		OP.2 TDD	OP.2 TDD	As specified in clause A.3.2.2.2.	
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1	
CP length			Normal	Normal		
	Channel Number		1	1	One E-UTRA TDD carrier frequency is used.	
(BWchannel)	nnel Bandwidth	MHz	10	10		
Correlation Ma Antenna Conf			2x2 Low	1x2	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2	
Out of sync	DCI format		1A	1A	As defined in clause 5.3.3.1.3 in TS 36.212	
transmission parameters (Note 1)	Number of Control OFDM symbols		2	2	Out of sync threshold Qout and the corresponding hypothetical	
,	Aggregation level	CCE	8	8	PDCCH/PCFICH transmission parameters	
	ρΑ, ρΒ		-3	0	are as specified in	
	Ratio of PDCCH to RS EPRE	dB	1	4	clause 7.6.1 and Table 7.6.1-1 respectively.	
	Ratio of PCFICH to RS EPRE	dB	1	4		
DRX cycle		ms	40	1280	See Table A.7.3.7.1-3	
Layer 3 filterin	ıg		Enabled	Enabled	Counters: N310 = 1; N311 = 1	
T310 timer		ms	0	0	T310 is disabled	
T311 timer		ms	1000	1000	T311 is enabled	
	Periodic CQI reporting mode		PUCCH 1-0	PUCCH 1- 0	As defined in table 7.2.2-1 in TS 36.213.	
. •	CQI reporting periodicity		1	1	Minimum CQI reporting periodicity	
Propagation of	hannel		ETU 70 Hz	AWGN		
T1		S	4	32		
T2		S	1.6	12.8		
T3		S	1.8	13		

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.7.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2 in DRX

Parameter	Unit	Test 1			Test 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel		_	1	_		1		
Number								
BW _{channel}	MHz		10			10		
Correlation Matrix			2x2 Low			1x2		
and Antenna								
Configuration								
Special subframe			6			6		
configuration Note1								
Uplink-downlink			1			1		
configuration Note2								
OCNG Pattern			00 0 755			0D 0 TD 0		
defined in A.3.2.2		OP.2 TDD			OP.2 TDD			
(TDD)		0						
ρα, ρΒ			-3		0			
PCFICH_RB	dB		1		4			
PDCCH_RA	dB		11		4			
PDCCH_RB	dB		1		4			
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB		2		0			
PHICH_RA	dB		-3			U		
PHICH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note3}	dB	_						
OCNG_RB ^{Note3}	dB	0.0		44.0			40.1	
SNR Note 8	dB	-2.3	-5.9	-11.9	-5.1	-9.1	-13.1	
N_{oc}	dBm/15	-98			-98			
	kHz		CT11 70 11			440/4/4		
Propagation condition	-1		ETU 70 Hz			AWGN		

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.7.1-1.

Table A.7.3.7.1-3: DRX-Configuration for E-UTRAN TDD out-of-sync tests

Field	Test1	Test2	Comment
Field	Value	Value	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Field	Test1 Test2 Value Value		Comment
TimeAlignmentTimer	infinity	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

Table A.7.3.7.1-4: TimeAlignmentTimer -Configuration for E-UTRAN TDD out-of-sync testing

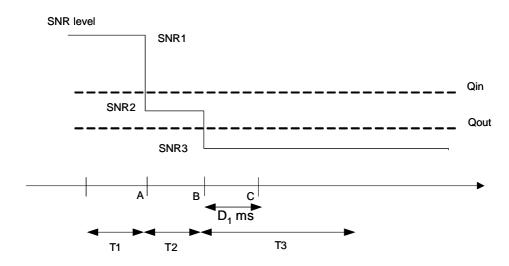


Figure A.7.3.7.1-1 SNR variation for out-of-sync testing in DRX

A.7.3.7.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In test 1 and test 2 during the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

In test 1 the UE shall stop transmitting uplink signal no later than time point C ($D_1 = 900$ ms after the start of time duration T3).

In test 2 the UE shall stop transmitting uplink signal no later than time point C (duration $D_1 = 6500$ ms after the start of time duration T3).

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

A.7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

A.7.3.8.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.8.1-1, A.7.3.8.1-2, A.7.3.8.1-3 and A.7.3.8.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.8.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and

to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.8.1-1: General test parameters for E-UTRAN TDD in-sync test in DRX

Paran	neter	Unit	Value	Comment
PCFICH/PDCCH/PI	PCFICH/PDCCH/PHICH parameters		R.6 TDD	As specified in clause A.3.1.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters	OCNG parameters		OP.2 TDD	As specified in clause A.3.2.2.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
E-UTRA RF Channe	el Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel B (BW _{channel})		MHz	10	
Antenna Configurat			1x2	
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
In sync transmission parameters	Number of Control OFDM symbols		2	In sync threshold Q _{in} and the corresponding hypothetical PDCCH/PCFICH transmission
(Note 1)	Aggregation level	CCE	4	parameters are as specified in clause and Table 7.6.1-2
	ρ _A , ρ _B		0	respectively.
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync transmission parameters	Number of Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission
(Note 1)	Aggregation level	CCE	8	parameters are as specified in clause 7.6.1 and Table 7.6.1-1
	ρΑ, ρΒ		0	respectively.
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle		ms	40	See Table A.7.3.8.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporti			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting period		ms	1	Minimum CQI reporting periodicity
Propagation channe	el		AWGN	
T1		S	4	
T2		S	1.6	
T3		S	1.46	
T4		S	0.4	
T5 Note 1: PDCCH/I	PCFICH correspond	S ina to the	4 a in-sync and o	lut of sync transmission
				Measurement Channel.

Table A.7.3.8.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring test # 1 in DRX

Parameter	Unit Test 1						
		T1	T2	T3	T4	T5	
E-UTRA RF Channel Number				1			
BW _{channel}	MHz			10			
Antenna Configuration				1x2			
Special subframe				6			
configuration Note1							
Uplink-downlink				1			
configuration Note2							
OCNG Pattern defined in							
A.3.2.2 (TDD)				OP.2 TDD			
ρ _Α , ρ _В				0			
PCFICH_RB	dB			4			
PDCCH_RA	dB	0					
PDCCH_RB	dB	0					
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB	0					
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note3}	dB						
OCNG_RB ^{Note3}	dB			.	r	1	
SNR Note 8	dB	-5.1	-9.1	-13.1	-9.1	-5.1	
N_{oc}	dBm/15			-98			
- · oc	kHz						
		AWGN					

- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 4:
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and
 - SNR5 respectively in figure A.7.3.8.1-1.

Table A.7.3.8.1-3: DRX-Configuration for E-UTRAN TDD out-of-sync tests

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table A.7.3.8.1-4: TimeAlignmentTimer - Configuration for E-UTRAN TDD out-of-sync testing

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

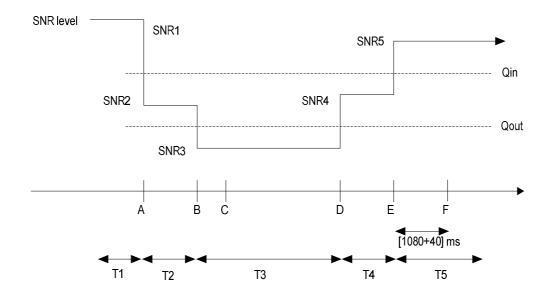


Figure A.7.3.8.1-1 SNR variation for in-sync testing in DRX

A.7.3.8.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.9 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction and Non-MBSFN ABS

A.7.3.9.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction when CRS assistance information is not provided. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.9.1-1 and A.7.3.9.1-2 below. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.9.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in the aggressor Cell 2 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell measurements. The patterns shall be configured prior to the start of T1.

Table A.7.3.9.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS

Parai	meter	Unit	Value	Comment
PCFICH/PDC	CH/PHICH		R.9.FDD	As specified in clause A.3.1.2.1.
parameters				None of the PDCCH are intended for the UE
0000	-4		00 0 000	under test
OCNG parame			OP.6 FDD	As specified in clause A.3.2.1.6.
Serving cell (P Neighbor cell	Cell)		Cell 1 Cell 2	Cell 1 is on E-UTRA RF channel number 1 Aggressor cell on E-UTRA RF channel number
Neighbor ceil			Cell 2	1
Neighbor cell	ABS		Non-MBSFN ABS	As defined in Table A.3.4.1.2-1
configuration			NI I	
CP length	hanal		Normal	One E LITPA EDD comics from constitution
E-UTRA RF C Number	nannei		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Chan	nel Bandwidth	MHz	10	
(BW _{channel})	nei bandwidin	IVII IZ	10	
Correlation Ma	atrix and		2x2 Low	Correlation Matrix and Antenna Configuration
Antenna Confi				are defined in TS 36.101 [5] Annex B.2.3.2
Out of sync	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
transmission	Number of		3	Out of sync threshold Qout and the
parameters	Control			corresponding hypothetical PDCCH/PCFICH
(Note 1)	OFDM			transmission parameters are as specified in
	symbols	005		clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρα, ρΒ		-3	
	Ratio of	dB	1	
	PDCCH to			
	RS EPRE			
	Ratio of	dB	1	
	PCFICH to			
DRX	RS EPRE		OFF	
Layer 3 filterin	α		Enabled	Counters:: N310 = 1; N311 = 1
T310 timer	9	ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI r	eporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting		ms	2	Minimum CQI reporting periodicity
Time offset be	tween cells		3 μs	Synchronous cells
T1		S	1	
T2		S	0.4	
T3		S	0.5	
Physical cell II) PCI		(PCI _{cell1} -PCI _{cell2})mod3!=	Cell IDs are chosen such that CRS from cells 1
-			0	and 2 do not overlap in frequency
ABS pattern			'100000010000001000	FDD ABS Pattern Info IE, as defined in TS
			00001000000010000000	36.423 [28], clause 9.2.54. Configured in Cell 2.
				The first/leftmost bit corresponds to the PCell
				subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string
				(40) divided by 10. No MBSFN subframes are
				cofigured in the ABS subframes.
Time domain r	neasurement		'1000000100000001000	Time domain measurement resource restriction
resource restri			00001000000010000000	pattern for serving cell measurement signalled
	•			to the UE in message
				measSubframePatternPCell-r10 as defined in
				TS 36.331, clause 6.3.2.
	CCH/PCFICH co erence Measure			nission parameters need not be included in the

Reference Measurement Channel

Table A.7.3.9.1-2: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring under time domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
Correlation Matrix			2x2 Low			2x2 Low	
and Antenna							
Configuration							
OCNG Pattern							
defined in A.3.2.1.6			OP.6 FDD			OP.6 FDD	
(FDD)							
ρ _A , ρ _B			-3			-3	
PCFICH_RB	dB		11		Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.2-1.		
PDCCH_RA	dB		1				
PDCCH_RB	dB		11				
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB		-3				
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note1}	dB						
OCNG RB ^{Note1}	dB	1					
SNR Note 6	dB	-1.3	-5.4	-12.4		5	
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition			ETU 30 Hz			ETU 30 Hz	
11 / 4 00110 1 11				11 // 4			

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
- Note 6: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3. 9.1-1.

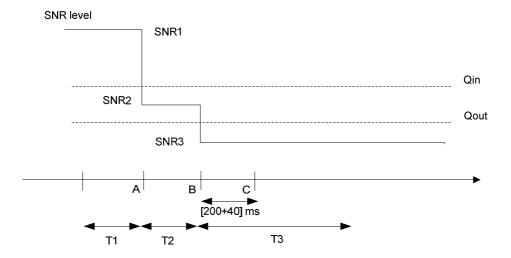


Figure A.7.3.9.1-1 SNR variation for out-of-sync testing

A.7.3.9.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

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

A.7.3.10 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non-MBSFN ABS

A.7.3.10.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction when CRS assistance information is not provided. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.10.1-1 and A.7.3.10.1-2 below. There are two cells, cell 1 is the serving cell and cell 2 is the neighbor aggressor cell. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.10.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Non-MBSFN ABS pattern is configured in Cell 2 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell measurements. The patterns shall be configured prior to the start of T1.

Table A.7.3.10.1-1: General test parameters for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS

Par	ameter	Unit	Value	Comment
PCFICH/PDC	CH/PHICH		R.9 TDD	As specified in clause A.3.1.2.2.
parameters				None of the PDCCH are intended for the UE under test
OCNG param	eters		OP.2 TDD	As specified in clause A.3.2.2.2.
Serving cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbor cell			Cell 2	Cell 2 is the aggressor cell on E-UTRA RF channel number 1
Neighbor cell configuration	ABS		Non-MBSFN ABS	As defined in Table A.3.4.1.2-1
CP length			Normal	
E-UTRA RF C	Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Char (BW _{channel})	nnel Bandwidth	MHz	10	
Correlation Ma Antenna Conf			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync transmission parameters	Number of Control OFDM symbols		3	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission
(Note 1)	Aggregation level	CCE	8	parameters are as specified in clause 7.6.1 and Table 7.6.1-1
	ρ _A , ρ _B		-3	respectively.
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Physical cell I	D PCI		(PCI _{cell1} -PCI _{cell2})mod3!=	Cell IDs are chosen such that CRS from cells 1 and 2 do not overalp in frequency.
ABS pattern			1000000001000000000	TDD ABS Pattern Info IE is configured in Cell 2 as defined in clause 9.2.54 in TS 36.423 [28]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are cofigured in the ABS subframes.
Time domain resource restr			1000000001000000000	MeasSubframePattern IE is configured in UE for serving cell measurement as defined in clause 6.3.6 in TS 36.331.
DRX			OFF	
Layer 3 filterin	ng		Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
Periodic CQI I	CQI reporting periodicity		1	Minimum CQI reporting periodicity
	Time offset between cells		3	
CQI reporting		μs		
CQI reporting	etween cells	μs	ETU30	
CQI reporting Time offset be Propagation of T1	etween cells	μs s	ETU30 1	
CQI reporting Time offset be Propagation of	etween cells	•	ETU30	

the Reference Measurement Channel.

Table A.7.3.10.1-2: Cell specific test parameters for E-UTRAN TDD for out-of-sync radio link monitoring under time domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1			1	_
Number							
BW _{channel}	MHz		10			10	
Correlation Matrix			2x2 Low			2x2 Low	
and Antenna							
Configuration							
Special subframe			6			6	
configuration Note1							
Uplink-downlink			1			1	
configuration Note2							
OCNG Pattern							
defined in A.3.2.2			OP.2 TDD		OP.2 TDD		
(TDD)							
ρ _A , ρ _B	ı.		-3		-3 Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.2-1.		
PCFICH_RB	<u>dB</u>		1				
PDCCH_RA	<u>dB</u>		1				
PDCCH_RB	dB		1		Iai	ole A.3.4.1.	2-1.
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB		2				
PHICH_RA	dB		-3				
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 3}	dB						
OCNG_RB ^{Note 3}	dB						
SNR Note 8	dB	-1.3	-5.4	-12.4		5	
N_{oc}	dBm/15		-98		-98		
	kHz						
Propagation condition			ETU30			ETU30	

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2 and T3 of active cell is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.10.1-1.

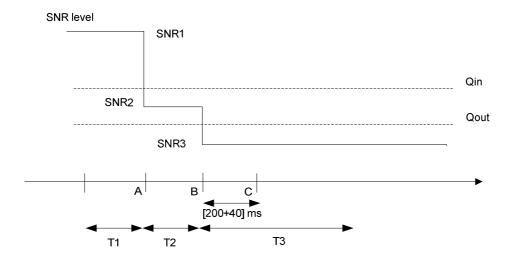


Figure A.7.3.10.1-1 SNR variation in active cell for out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS

A.7.3.10.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of the time duration T3).

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

A.7.3.11 E-UTRAN FDD Radio Link Monitoring Test for In-sync for Non-MBSFN ABS

A.7.3.11.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction when CRS assistance information is not provided. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.11.1-1 and A.7.3.11.1-2 below. There are two cells in the test: Cell 1 is the Active cell and Cell 2 is the Neighbor cell. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.11.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in Cell 2 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell measurements. The patterns shall be configured prior to the start of T1.

Table A.7.3.11.1-1: General test parameters for E-UTRAN FDD in-sync testing under time domain measurement resource restriction

Par	ameter	Uni	Value	Comment
PCFICH/PDiparameters	CCH/PHICH	t	R.9 FDD	As specified in clause A.3.1.2.1. None of the PDCCH are intended for the UE under test
OCNG parar	meters		OP.6 FDD	As specified in clause A.3.2.1.6.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbor ce	II		Cell 2	Cell 2 is on E-UTRA RF channel number 1; Cell 2 generates interference over restricted resources.
Neighbor ce configuration			Non- MBSFN ABS	As defined in Table A.3.4.1.2-2
CP length			Normal	
E-UTRA RF Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Cha (BWchannel	annel Bandwidth)	MH z	10	
Correlation N Antenna Cor	nfiguration		2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
In sync transmissi on	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission
parameter s for the	Aggregation level	CC E	4	parameters are as specified in clause and Table 7.6.1-2
active cell	ρΑ, ρΒ		-3	respectively.
(Note 1)	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync transmissi	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission
on parameter	Aggregation level	CC E	8	parameters are as specified in clause 7.6.1 and Table 7.6.1-1
s for active	ρΑ, ρΒ		-3	respectively.
cell (Note 1)	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
	Layer 3 filtering		Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms ms	2000	T310 is enabled
T311 timer Periodic CQ	Periodic CQI reporting mode		1000 PUCCH 1-	T311 is enabled As defined in table 7.2.2-1 in TS
CQI reportin	g periodicity	ms	2	36.213. Minimum CQI reporting
	petween cells	μs	3	periodicity
Propagation	channel	_	ETU30	
T1		S	0.5	
T2		S	0.4	

T3	S	1.46	
T4	S	0.4	
T5	S	1	
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod3 != 0	Cell IDs are chosen such that CRS from cells 1 and 2 do not overalp in frequency
ABS pattern		(100000001 000000010 000000100 000001000 0000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are cofigured in the ABS subframes.
Time domain measurement resource restriction pattern Note 1: PDCCH/PCFICH or		'100000001 00000010 000000100 000001000 0000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.

Table A.7.3.11.1-2: Cell specific test parameters for E-UTRAN FDD for in-sync radio link monitoring under time domain measurement resource restriction

Parameter	Unit		Cell 1					Cell 2	2			
		T1 T2 T3 T4 T5				T1	T2	T3	T4	T5		
E-UTRA RF Channel				1		-				1		
Number												
BW _{channel}	MHz			10						10		
Correlation Matrix				2x2 L	.ow					2x2 Lo	W	
and Antenna												
Configuration												
PCFICH/PDCCH/PHI				R.9 F	DD					R.9 FD	D	
CH parameters												
Number of Control				3						3		
OFDM symbols												
OCNG Pattern												
defined in A.3.2.1.6				OP.6 I	-DD				(OP.6 FI	DD	
(FDD)												
ра, рв				-3						-3		
PCFICH_RB	dB			1				Non-ABS and ABS subframe				
PDCCH_RA	dB			-3				channel powers defined in Table				
PDCCH_RB	dB			-3				A.3.4.1.2-2.				
PBCH_RA	dB											
PBCH_RB	dB							1				
PSS_RA	dB											
SSS_RA	dB			•								
PHICH_RA	dB			-3								
PHICH_RB	dB											
PDSCH_RA	dB											
PDSCH_RB	dB											
OCNG_RA ^{Note 1}	dB											
OCNG_RB ^{Note 1}	dB											
SNR Note 6	dB	-1.3	-1.3 -5.4 -12.4 -7.3 -1.3					5				
N_{oc}	dBm/15	-98			-98							
	kHz											
Propagation condition			ETU30							ETU3)	

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.

Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.

Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.

Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.

Note 6: The SNR in time periods T1, T2, T3, T4 and T5 of the active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.11.1-1.

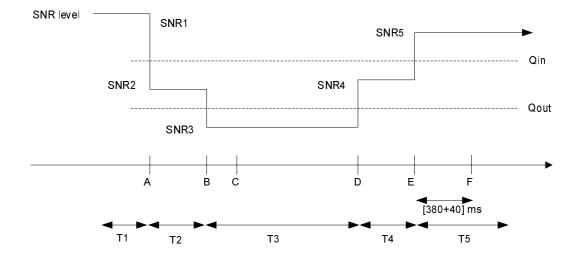


Figure A.7.3.11.1-1 SNR variation in the active cell for in-sync testing under time domain measurement resource restriction

A.7.3.11.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.12 E-UTRAN TDD Radio Link Monitoring Test for In-sync for Non-MBSFN ABS

A.7.3.12.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction when CRS assistance information is not provided. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.12.1-1 and A.7.3.12.1-2 below. There are two cells in the test: Cell 1 is the Active cell and Cell 2 is the Neighbor cell. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.12.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Non-MBSFN ABS pattern is configured in the aggressor Cell 2 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell measurements. The patterns shall be configured prior to the start of T1.

Table A.7.3.12.1-1: General test parameters for E-UTRAN TDD in-sync testing under time domain measurement resource restriction

Par	ameter	Uni t	Value	Comment
PCFICH/PD	CCH/PHICH		R.9 TDD	As specified in
parameters				clause A.3.1.2.2.
•				None of the PDCCH are
			00.000	intended for the UE under test
OCNG para	meters		OP.2 TDD	As specified in
Active cell			Cell 1	clause A.3.2.2.2. Cell 1 is on E-UTRA RF
Active cell			Cell 1	channel number 1
Neighbor ce	II		Cell 2	Cell 2 is on E-UTRA RF
				channel number 1; Cell 2
				generates interference over
Neighbor ce	II A D C		Non-MBSFN	restricted resources. As defined in Table A.3.4.1.2-
configuration			ABS	2
CP length			Normal	_
E-UTRA RF	Channel		1	One E-UTRA TDD carrier
Number				frequency is used.
	annel Bandwidth	MH	10	
(BWchannel		Z	2x2 Low	Convolation Matrix and
Correlation I Antenna Co			ZXZ LOW	Correlation Matrix and Antenna Configuration are
Antenna Con	ingulation			defined in TS 36.101 [5]
				Annex B.2.3.2
	DCI format		1C	As defined in clause 5.3.3.1.4
				in TS 36.212
In sync	Number of		3	In sync threshold Qin and the
transmissi on	Control OFDM symbols			corresponding hypothetical PDCCH/PCFICH transmission
parameter	Aggregation	CC	4	parameters are as specified in
s for the	level	E		clause and Table 7.6.1-2
active cell	ρΑ, ρΒ		-3	respectively.
(Note 1)	Ratio of	dB	-3]
	PDCCH to RS			
	EPRE Ratio of	dB	1	-
	PCFICH to RS	uБ		
	EPRE			
	DCI format		1A	As defined in clause 5.3.3.1.3
				in TS 36.212
Out of	Number of		3	Out of sync threshold Qout
sync transmissi	Control OFDM symbols			and the corresponding hypothetical PDCCH/PCFICH
on	Aggregation	CC	8	transmission parameters are
parameter	level	E		as specified in clause 7.6.1
s for active	ρΑ, ρΒ		-3	and Table 7.6.1-1
cell (Note	Ratio of	dB	1	respectively.
1)	PDCCH to RS			
	EPRE Patio of	40	1	-
	Ratio of PCFICH to RS	dB	1	
	EPRE			
DRX			OFF	
Layer 3 filtering			Enabled	Counters:
T210 timer			0000	N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer Periodic CQI reporting mode		ms	1000 PUCCH 1-0	T311 is enabled As defined in table 7.2.2-1 in
I GIIOGIC CQ	r reporting mode		1 000111-0	TS 36.213.
CQI reportin	g periodicity	ms	1	Minimum CQI reporting
				periodicity
	oetween cells	μs	3	
Propagation	channel		ETU30	

T1	S	0.5	
T2	S	0.4	
T3	S	1.46	
T4	S	0.4	
T5	S	1	
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod3 != 0	Cell IDs are chosen such that CRS from cells 1 and 2 do not overalp in frequency
ABS pattern		1000000000	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are cofigured in the ABS subframes.
Time domain measurement resource restriction pattern		100000000 100000000	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2. Configured in Cell 1.

Table A.7.3.12.1-2: Cell specific test parameters for E-UTRAN TDD for in-sync radio link monitoring under time domain measurement resource restriction

Parameter	Unit		Cell 1						Cell	2	
		T1	T1 T2 T3 T4 T5				T1	T2	T3	T4	T5
E-UTRA RF Channel			•	1					1		
Number											
BW _{channel}	MHz			10			10				
Correlation Matrix				2x2 Low	,				2x2 Lo	w	
and Antenna											
Configuration											
Special subframe				6					6		
configuration Note1											
Uplink-downlink				1					1		
configuration Note2											
PCFICH/PDCCH/PHI				R.9 TDD					R.9 TE	DD	
CH parameters											
Number of Control				3					3		
OFDM symbols											
OCNG Pattern											
defined in A.3.2.2			OP.2 TDD					(OP.2 T	DD	
(TDD)											
ρ _A , ρ _B				-3			-3				
PCFICH_RB	dB			1			Non-ABS and ABS subframe				
PDCCH_RA	dB			-3			channel powers defined in Table				
PDCCH_RB	dB			-3			A.3.4.1.2-2.				
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB			-3							
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA ^{Note 3}	dB										
OCNG_RB ^{Note 3}	dB										
SNR Note 8	dB	-1.3	-1.3 -5.4 -12.4 -7.3 -1.3						5		
N_{oc}	dBm/15		-98				-98				
1 voc	kHz										
Propagation condition				ETU30					ETU3	0	

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.12.1-1.

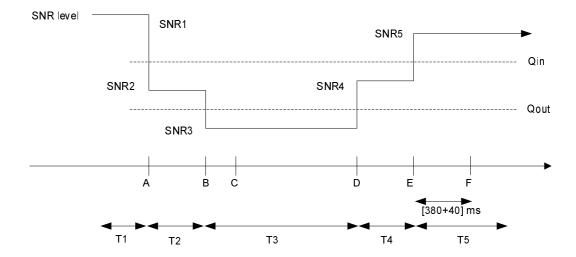


Figure A.7.3.12.1-1 SNR variation in active cell for in-sync testing under time domain measurement resource restriction

A.7.3.12.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

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

A.7.3.13 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS

A.7.3.13.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction when CRS assistance information is not provided. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.13.1-1 and A.7.3.13.1-2 below. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.13.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in the aggressor Cell 2 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell measurements. The patterns shall be configured prior to the start of T1.

Table A.7.3.13.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS

Para	meter	Unit	Value	Comment
PCFICH/PDC	CH/PHICH		R.9.FDD	As specified in clause A.3.1.2.1.
parameters				None of the PDCCH are intended for the UE under test
OCNG parame	eters		OP.6 FDD for the serving	As specified in clause A.3.2.1.6 and A.3.2.1.9
			cell (Cell 1)	respectively
			OP.9 FDD for the	
Coming call (F	20-11)		neighbour cell (Cell 2)	Call 4 is an E LITPA DE channel number 4
Serving cell (F Neighbor cell	Cell)		Cell 1 Cell 2	Cell 1 is on E-UTRA RF channel number 1 Aggressor cell on E-UTRA RF channel number
Neighbor ceil			Celi 2	1
Neighbor cell	ABS		MBSFN ABS	As defined in Table A.3.4.2.2-1
configuration				
CP length			Normal	
E-UTRA RF C	hannel		1	One E-UTRA FDD carrier frequency is used.
Number E LITPA Chan	nnel Bandwidth	MHz	10	
(BW _{channel})	inei banuwiuin	IVITIZ	10	
Correlation Ma	atrix and		2x2 Low	Correlation Matrix and Antenna Configuration
Antenna Confi	iguration			are defined in TS 36.101 [5] Annex B.2.3.2
Out of sync	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
transmission	Number of		3	Out of sync threshold Qout and the
parameters	Control			corresponding hypothetical PDCCH/PCFICH
(Note 1)	OFDM symbols			transmission parameters are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation	CCE	8	clause 7.0.1 and Table 7.0.1-1 respectively.
	level	002		
	ρΑ, ρΒ		-3	
	Ratio of	dB	1	
	PDCCH to			
	RS EPRE	-ID		
	Ratio of PCFICH to RS EPRE	dB	1	
DRX	INO EI INE		OFF	
Layer 3 filterin	ıg		Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI r	reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting	periodicity	ms	2	Minimum CQI reporting periodicity
Time offset be	etween cells		3 μs	Synchronous cells
T1		S	1	
T2		S	0.4	
T3		S	0.5	
Physical cell II	D PCI		(PCI _{cell1} -PCI _{cell2}) mod 3 =	Cell IDs are chosen such that CRS from cells 1
,			0, PCI _{cell1} not equal to	and 2 overlap in frequency
			PCI _{cell2}	
ABS pattern			'010000010000001000	FDD ABS Pattern Info IE, as defined in TS
			00000010000001000000	36.423 [28], clause 9.2.54. Configured in Cell 2.
				The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN
				mod $x = 0$, where x is the size of the bit string
				(40) divided by 10. MBSFN subframes are
				cofigured in the ABS subframes.
Time domain ı			'010000010000001000	Time domain measurement resource restriction
resource restr	iction pattern		00000010000001000000	pattern for serving cell measurement signalled
				to the UE in message measSubframePattern-
Note 1: PD	CCH/DCEICH ~	Orrespon	ling to the out of syna transm	Serv-r10 as defined in TS 36.331, clause 6.3.2. hission parameters need not be included in the
	ference Measur			nosion parameters need not be included in the
1,(0)	modean			

Table A.7.3.13.1-2: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS

Parameter	Unit		Cell 1			Cell 2	
		T1	T1 T2 T3		T1	T2	T3
E-UTRA RF Channel			1		1		
Number							
BW _{channel}	MHz		10			10	
Correlation Matrix			2x2 Low			2x2 Low	
and Antenna							
Configuration							
OCNG Pattern							
defined in A.3.2.1			OP.6 FDD			OP.9 FDD	
(FDD)							
ρ _A , ρ _B			-3			-3	
PCFICH_RB	dB		1			S and ABS	
PDCCH_RA	dB		1		channel powers defined in Table A.3.4.2.2-1.		
PDCCH_RB	dB		11				
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB		_				
PHICH_RA	dB		-3				
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note1}	dB						
OCNG_RB ^{Note1}	dB						
SNR Note 6	dB	-1.3 -5.4 -12.4			5		
N_{oc}	dBm/15	-98			-98		
- ' oc	kHz						
Propagation condition		ETU 30 Hz				ETU 30 Hz	•

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
- Note 6: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.13.1-1.

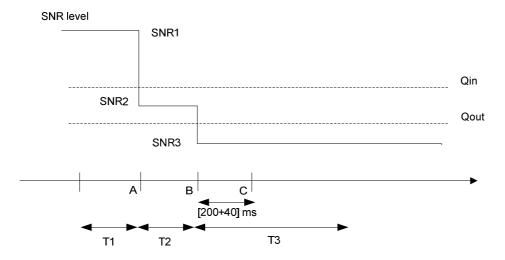


Figure A.7.3.13.1-1 SNR variation for out-of-sync testing

A.7.3.13.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

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

A.7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS

A.7.3.14.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction when CRS assistance information is not provided. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.14.1-1 and A.7.3.14.1-2 below. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.14.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in the aggressor Cell 2 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell measurements. The patterns shall be configured prior to the start of T1.

Table A.7.3.14.1-1: General test parameters for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS

Para	meter	Unit	Value	Comment
PCFICH/PDC0 parameters			R.9.TDD	As specified in clause A.3.1.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD for the serving cell (Cell 1) OP.6 TDD for the neighbour cell (Cell 2)	As specified in clause A.3.2.2.2 and A.3.2.2.6 respectively
Serving cell (F	Cell)		Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbor cell			Cell 2	Aggressor cell on E-UTRA RF channel number 1
Neighbor cell a configuration	ABS		MBSFN ABS	As defined in Table A.3.4.2.2-1
CP length			Normal	
E-UTRA RF C Number	hannel		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	
Correlation Ma			2x2 Low	Correlation Matrix and Antenna Configuration
Antenna Confi				are defined in TS 36.101 [5] Annex B.2.3.2
Out of sync	DCI format	<u> </u>	1A	As defined in clause 5.3.3.1.3 in TS 36.212
transmission parameters (Note 1)	Number of Control OFDM symbols		3	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρΑ, ρΒ		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX	•		OFF	
Layer 3 filterin	g		Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer	eporting mode	ms	1000 PUCCH 1-0	T311 is enabled As defined in table 7.2.2-1 in TS 36.213.
CQI reporting		ms	1	Minimum CQI reporting periodicity
Time offset be	tween cells		3 μs	Synchronous cells
T1		S	1	
T2		s	0.4	
T3		s	0.5	
Physical cell II	O PCI		(PCI _{cell1} -PCI _{cell2}) mod 3 = 0, PCI _{cell1} not equal to PCI _{cell2}	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency
ABS pattern			'0000100000000100000'	MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time domain resource restri	ction pattern		'0000100000000100000'	Time-domain measurement resource restriction pattern for serving cell measurements signalled to the UE in message measSubframePattern-Serv-r10 as defined in TS 36.331, clause 6.3.2.
	CCH/PCFICH co erence Measure			nission parameters need not be included in the

ETSI

Table A.7.3.14.1-2: Cell specific test parameters for E-UTRAN TDD for out-of-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Cell 1				Cell 2	
		T1	T2	Т3	T1	T2	T3
E-UTRA RF Channel			1		1		
Number							
BW _{channel}	MHz		10			10	
Special subframe configuration Note1			6			6	
Uplink-downlink configuration Note2			1			1	
Correlation Matrix and Antenna Configuration			2x2 Low			2x2 Low	
OCNG Pattern defined in A.3.2.2 (TDD)		OP.2 TDD			OP.6 TDD		
ρΑ, ρΒ			-3		-3		
PCFICH_RB	dB		1		Non-ABS and ABS subframe		
PDCCH_RA	dB		1		channel powers defined in		
PDCCH_RB	dB		1		Table A.3.4.2.2-1.		
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB		_				
PHICH_RA	dB		-3				
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note3}	dB						
OCNG_RB ^{Note3}	dB						
SNR Note 7,8	dB	-1.3 -5.4 -12.4				5	
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 30 Hz				ETU 30 Hz	

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink subframe configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
- Note 8: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in Figure A.7.3.14.1-1.

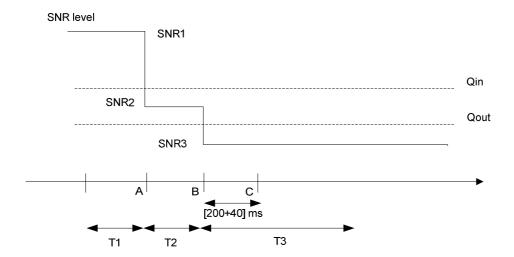


Figure A.7.3.14.1-1 SNR variation for out-of-sync testing

A.7.3.14.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

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

A.7.3.15 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS

A.7.3.15.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction when CRS assistance information is not provided. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.15.1-1 and A.7.3.15.1-2 below. There are two cells, cell 1 is the serving cell and cell 2 is the neighbour aggressor cell. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.15.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in Cell 2 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell measurements. The patterns shall be configured prior to the start of T1.

Table A.7.3.15.1-1: General test parameters for E-UTRAN FDD in-sync testing under time domain measurement resource restriction with MBSFN ABS

Para	meter	Unit	Value	Comment
PCFICH/PDCC parameters	CH/PHICH		R.9 FDD	As specified in clause A.3.1.2.1. None of the PDCCH are intended for the UE under test
Serving cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is the aggressor cell on E- UTRA RF channel number 1
Neighbour cell configuration	ABS		MBSFN ABS	As defined in Table A.3.4.2.2-2
OCNG parame			OP.6 FDD	As specified in clause A.3.2.1.6.
OCNG parame	ters for Cell 2		OP.9 FDD	As specified in clause A.3.2.1.9.
CP length	DC		Normal	
Neighbor cell A configuration	/B2		MBSFN ABS	
	nannel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Chani (BWchannel)	nel Bandwidth	MHz	10	inequency is used.
	trix and Antenna		2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
In sync transmission parameters	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission
(Note 1)	Aggregation level	CCE	4	parameters are as specified in clause and Table 7.6.1-2
	ρΑ, ρΒ		-3	respectively.
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync transmission parameters	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission
(Note 1)	Aggregation level	CCE	8	parameters are as specified in clause 7.6.1 and Table 7.6.1-1
	ρΑ, ρΒ		-3	respectively.
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Physical cell ID			(PCI _{cell1} -PCI _{cell2}) mod 3 = 0, PCIcell1 not equal to PCIcell2	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency.
ABS pattern			010000001000000010000 0000010000001000000	FDD ABS Pattern Info IE is configured in Cell 2 as defined in clause 9.2.54 in TS 36.423 [28]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time domain n	neasurement		01000000100000010000	MeasSubframePattern IE is

resource restriction pattern		0000010000001000000	configured in UE for serving cell measurement as defined in clause 6.3.6 in TS 36.331.
DRX		OFF	
Layer 3 filtering		Enabled	Counters: N310 = 1; N311 = 1
T310 timer	ms	2000	T310 is enabled
T311 timer	ms	1000	T311 is enabled
Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	2	Minimum CQI reporting periodicity
Time offset between cells	μs	3	
Propagation channel		ETU30	
T1	S	0.5	
T2	S	0.4	
T3	S	1.46	
T4	S	0.4	
T5	S	1	

Table A.7.3.15.1-2: Cell specific test parameters for E-UTRAN FDD for in-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Cell 1 T1 T2 T3 T4 T5					Cell 2	2			
					T1	T2	T3	T4	T5		
E-UTRA RF Channel		1			1						
Number											
BW _{channel}	MHz	10						10			
Correlation Matrix				2x2 Lov	V				2x2 Lo	W	
and Antenna											
Configuration											
OCNG Pattern					_						
defined in A.3.2.1				OP.6 FD	D			(OP.9 FI	DD	
(FDD)											
ρα, ρΒ				-3			-3				
PCFICH_RB	dB			1			Non-ABS and ABS subframe				
PDCCH_RA	dB			-3			channel powers defined in Table				
PDCCH_RB	dB			-3			A.3.4.2.2-2.				
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB			•							
PHICH_RA	dB			-3							
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA ^{Note 1}	dB										
OCNG_RB ^{Note 1}	dB										
SNR Note 6	dB	-1.3	-5.4	-12.4	-7.3	-1.3			5		
N_{oc}	dBm/15			-98					-98		
	kHz										
Propagation condition				ETU30					ETU3	U	

- Note 1: OCNG shall be used such that the resources in Cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 of the active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.15.1-1.

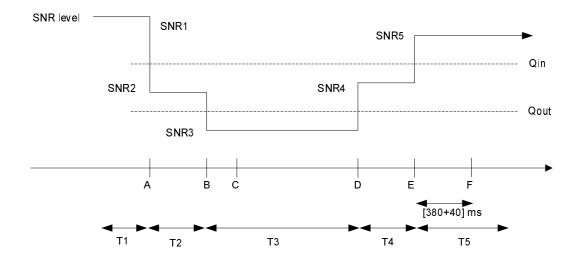


Figure A.7.3.15.1-1 SNR variation in the active cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

A.7.3.15.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS

A.7.3.16.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction when CRS assistance information is not provided. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.16.1-1 and A.7.3.16.1-2 below. There are two cells, cell 1 is the serving cell and cell 2 is the neighbour aggressor cell. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.15.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

MBSFN ABS pattern is configured in Cell 2 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell measurements. The patterns shall be configured prior to the start of T1.

Table A.7.3.16.1-1: General test parameters for E-UTRAN TDD in-sync testing under time domain measurement resource restriction with MBSFN ABS

Para	meter	Unit	Value	Comment
PCFICH/PDCC parameters	CH/PHICH		R.9 TDD	As specified in clause A.3.1.2.2. None of the PDCCH are intended for the UE under test
Serving cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is the aggressor cell on E- UTRA RF channel number 1
Neighbour cell ABS configuration			MBSFN ABS	As defined in Table A.3.4.2.2-2
	OCNG parameters for Cell 1		OP.2 TDD	As specified in clause A.3.2.2.2.
OCNG parame CP length	ters for Cell 2		OP.6 TDD Normal	As specified in clause A.3.2.2.6.
Neighbor cell A configuration	ABS		MBSFN ABS	
	nannel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Chani (BWchannel)	nel Bandwidth	MHz	10	
	trix and Antenna		2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
In sync transmission parameters	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission
(Note 1)	Aggregation level	CCE	4	parameters are as specified in clause and Table 7.6.1-2
	ρΑ, ρΒ		-3	respectively.
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync transmission parameters	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission
(Note 1)	Aggregation level	CCE	8	parameters are as specified in clause 7.6.1 and Table 7.6.1-1
	ρΑ, ρΒ		-3	respectively.
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Physical cell ID			(PCI _{cell1} -PCI _{cell2}) mod 3 = 0, PCIcell1 not equal to PCIcell2	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency.
ABS pattern			00001000000000100000	TDD ABS Pattern Info IE is configured in Cell 2 as defined in clause 9.2.54 in TS 36.423 [28]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time domain m	neasurement		00001000000000100000	MeasSubframePattern IE is

resource restriction pattern			configured in UE for serving cell measurement as defined in clause 6.3.6 in TS 36.331.
DRX		OFF	
Layer 3 filtering		Enabled	Counters: N310 = 1; N311 = 1
T310 timer	ms	2000	T310 is enabled
T311 timer	ms	1000	T311 is enabled
Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	1	Minimum CQI reporting periodicity
Time offset between cells	μs	3	
Propagation channel		ETU30	
T1	S	0.5	
T2	S	0.4	
T3	S	1.46	
T4	S	0.4	
T5	S	1	

Table A.7.3.16.1-2: Cell specific test parameters for E-UTRAN TDD for in-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Cell 1 T1 T2 T3 T4 T5					Cell 2	2			
	•				T1 T2 T3 T4 T5						
E-UTRA RF Channel		1			1						
Number											
BW _{channel}	MHz			10					10		
Correlation Matrix				2x2 Lov	٧				2x2 Lo	W	
and Antenna											
Configuration											
Special subframe				6					6		
configuration Note1											
Uplink-downlink				1					1		
configuration Note2											
OCNG Pattern											
defined in A.3.2.2			(OP.2 TD	D			(OP.6 TI	DD	
(TDD)											
ρ _A , ρ _B				-3			-3				
PCFICH_RB	dB			1			Non-ABS and ABS subframe channel powers defined in Table				
PDCCH_RA	dB			-3							
PDCCH_RB	dB			-3				P	.3.4.2.2	2-2.	
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB			0							
PHICH_RA	dB			-3							
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RANote 1	dB										
OCNG_RB ^{Note 1}	dB										
SNR Note 8	dB	-1.3	-5.4	-12.4	-7.3	-1.3			5		
N_{oc}	dBm/15			-98					-98		
1 oc	kHz										
Propagation condition		ETU30				ETU30					

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in Cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of the active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.16.1-1.

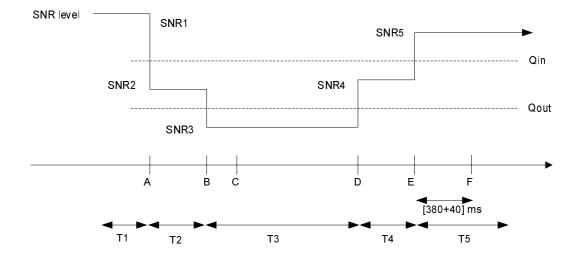


Figure A.7.3.16.1-1 SNR variation in the active cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

A.7.3.16.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.17 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.7.3.17.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.17.1-1 and A.7.3.17.1-2 below. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and 3 are the neighbour cells. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.17.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing Pcell measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2 and Cell 3, which shall be valid during T1, T2 and T3 in this test. The non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

Table A.7.3.17.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS

Para	meter	Unit	Value	Comment
PCFICH/PDC	CH/PHICH		R.7 FDD	As specified in clause A.3.1.2.1.
parameters				None of the PDCCH are intended for the UE under test
OCNG parame	eters		OP.6 FDD	As specified in section A.3.2.1.6.
PCell	31010		Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbor cells	i		Cell 2 and Cell 3	Both of aggressor cells on E-UTRA RF channel number 1
Neighbor cell	ABS		Non-MBSFN ABS	As defined in Table A.3.4.1.2-1
configuration			N	
CP length			Normal	0 5 1170 4 500
E-UTRA RF C Number	nannei		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	
Correlation Ma			2x2 Low	Correlation Matrix and Antenna Configuration
Antenna Confi				are defined in TS 36.101 [5] Annex B.2.3.2
Out of sync	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
transmission	Number of		2	Out of sync threshold Qout and the
parameters	Control			corresponding hypothetical PDCCH/PCFICH
(Note 1)	OFDM			transmission parameters are as specified in
	symbols			clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρΑ, ρΒ		-3	
	Ratio of	dB	1	
	PDCCH to RS EPRE			
	Ratio of PCFICH to	dB	1	
	RS EPRE			
DRX			OFF	
Layer 3 filterin	g		Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI r	eporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting	· ·	ms	2	Minimum CQI reporting periodicity
Time offset be	tween cells	μs	Cell 2 time offset with	Three synchronous cells
			respect to Cell 1: 3	
			Cell 3 time offset with	
			respect to Cell 1: 2	
Frequency shi	ft between	Hz	Cell 2 frequency shift with	
cells			respect to Cell 1: 300	
			Cell 3 frequency shift with	
			respect to Cell 1: -100	
T1		S	1	
T2		S	0.4	
T3		S	0.5	
			(PCI _{cell1} -PCI _{cell2})mod3 = 0	Cell PCIs are selected so that all conditions are
	_		(PCI _{cell1} -PCI _{cell3})mod3!= 0	met
Physical cell II	Os		PCI _{cell1} not equal to	mot
			PCI _{cell2}	
ABS pattern			'100000010000001000	FDD ABS Pattern Info IE, as defined in TS
ABO pattern			00001000000010000000	36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes.
				Configured in both Cell 2 and Cell 3 prior to the start of T1.

	Time domain measurement resource restriction pattern		'100000010000001000 00001000000010000000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.			
CRS	physCellId		see PCI conditions above	The CRS assistance information is provided for			
assistance information	antennaPort sCount		an2	Cell 2 and Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig			
	mbsfn- SubframeCo nfigList		oneFrame = '000000'	element with subframe allocation oneFrame='000000'			
	3 · · · · · · · · · · · · · · · · · · ·						
Ref	Reference Measurement Channel						

Table A.7.3.17.1-2: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS

Parameter	Unit		Cell 1		Cell 2	Cell 3
		T1	T2	T3	T1-T3	T1-T3
E-UTRA RF Channel		1		1	1	
Number						
BW _{channel}	MHz		10		10	10
Correlation Matrix			2x2 Low		2x2 Low	2x2 Low
and Antenna						
Configuration						
OCNG Pattern						
defined in A.3.2.1.6			OP.6 FDD		OP.6 FDD	OP.6 FDD
(FDD)						
ρа, ρв			-3		-3	-3
PCFICH_RB	dB		1		Non-ABS and	Non-ABS and
PDCCH_RA	dB		1		ABS subframe	ABS subframe
PDCCH_RB	dB		1		channel powers	channel powers
PBCH_RA	dB				defined in Table	defined in Table
PBCH_RB	dB				A.3.4.1.2-1.	A.3.4.1.2-1.
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB		-3			
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note1}	dB					
OCNG RB ^{Note1}	dB					
SNR Note 6	dB	-1.5	-5.2	-13.7	4	2
N_{oc}	dBm/15		-98		-98	-98
1 oc	kHz					
Propagation condition			ETU 30 Hz		ETU 30 Hz	ETU 30 Hz

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS RFs
- Note 6: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.17.1-1.

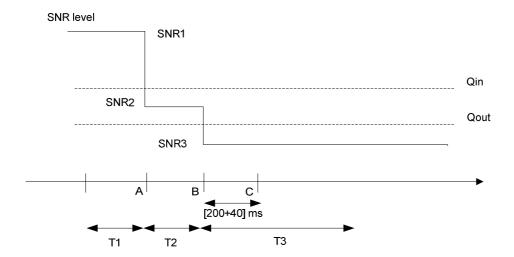


Figure A.7.3.17.1-1 SNR variation for out-of-sync testing

A.7.3.17.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

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

A.7.3.18 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.7.3.18.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction with CRS assistance information. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.18.1-1 and A.7.3.18.1-2 below. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and 3 are the neighbour cells. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.18.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing Pcell measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2 and Cell 3, which shall be valid during T1, T2 and T3 in this test. The non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

Table A.7.3.18.1-1: General test parameters for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS

Parai	neter	Unit	Value	Comment
PCFICH/PDC0	CH/PHICH		R.7.TDD	As specified in clause A.3.1.2.2.
parameters				None of the PDCCH are intended for the UE under test
OCNG parame	eters		OP.2 TDD	As specified in clause A.3.2.2.2
PCell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbor cells			Cell 2 and Cell 3	Both of aggressor cells on E-UTRA RF channel number 1
Neighbor cell /	ABS		Non-MBSFN ABS	As defined in Table A.3.4.1.2-1
configuration CP length			Normal	
E-UTRA RF C	hannal		1	One FUTDA TDD corrier fraguency is used
Number	nannei		I	One E-UTRA TDD carrier frequency is used.
E-UTRA Chan (BW _{channel})		MHz	10	
Correlation Ma			2x2 Low	Correlation Matrix and Antenna Configuration
Antenna Confi				are defined in TS 36.101 [5] Annex B.2.3.2
Out of sync	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
transmission	Number of		2	Out of sync threshold Qout and the
parameters	Control			corresponding hypothetical PDCCH/PCFICH
(Note 1)	OFDM			transmission parameters are as specified in
	symbols			clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρα, ρв		-3	
	Ratio of	dB	1	
	PDCCH to RS EPRE			
	Ratio of PCFICH to	dB	1	
	RS EPRE			
DRX			OFF	
Layer 3 filtering	g		Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI r	eporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting		ms	1	Minimum CQI reporting periodicity
Time offset be	tween cells	μs	Cell 2 time offset with	Three synchronous cells
			respect to Cell 1: 3	
			Cell 3 time offset with	
			respect to Cell 1: 2	
Frequency shi	ft between	Hz	Cell 2 frequency shift with	
cells			respect to Cell 1: 300	
			Cell 3 frequency shift with	
				i e
			respect to Cell 1: -100	
T1		S	respect to Cell 1: -100	
T1 T2		S S		
			1	
T2		S	1 0.4 0.5	Cell PCIs are selected so that all conditions are
T2 T3		S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0	Cell PCIs are selected so that all conditions are
T2	Os .	S	1 0.4 0.5	Cell PCIs are selected so that all conditions are met
T2 T3	Os	S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0 (PCI _{cell1} -PCI _{cell3})mod3!= 0	
T2 T3 Physical cell II	Os	S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0 (PCI _{cell1} -PCI _{cell3})mod3!= 0 PCI _{cell1} not equal to PCI _{cell2}	met
T2 T3	Os	S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0 (PCI _{cell1} -PCI _{cell3})mod3!= 0 PCI _{cell1} not equal to	met TDD ABS Pattern Info IE, as defined in TS
T2 T3 Physical cell II	Os	S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0 (PCI _{cell1} -PCI _{cell3})mod3!= 0 PCI _{cell1} not equal to PCI _{cell2}	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit
T2 T3 Physical cell II	Os	S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0 (PCI _{cell1} -PCI _{cell3})mod3!= 0 PCI _{cell1} not equal to PCI _{cell2}	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the
T2 T3 Physical cell II	Os	S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0 (PCI _{cell1} -PCI _{cell3})mod3!= 0 PCI _{cell1} not equal to PCI _{cell2}	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x
T2 T3 Physical cell II	Os	S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0 (PCI _{cell1} -PCI _{cell3})mod3!= 0 PCI _{cell1} not equal to PCI _{cell2}	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No
T2 T3 Physical cell II	Os	S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0 (PCI _{cell1} -PCI _{cell3})mod3!= 0 PCI _{cell1} not equal to PCI _{cell2}	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS
T2 T3 Physical cell II	Os	S	1 0.4 0.5 (PCI _{cell1} -PCI _{cell2})mod3 = 0 (PCI _{cell1} -PCI _{cell3})mod3!= 0 PCI _{cell1} not equal to PCI _{cell2}	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No

Time domain resource restr		'0000100000000100000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.					
CRS	physCellId	see PCI conditions above	The CRS assistance information is provided for					
assistance information	antennaPort sCount	an2	Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with					
	mbsfn- SubframeCo nfigList	oneFrame = '000000'	subframe allocation oneFrame='000000'					
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the								
Reference Measurement Channel								

Table A.7.3.18.1-2: Cell specific test parameters for E-UTRAN TDD for out-of-sync radio link monitoring under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS

Parameter	Unit	Cell 1			Cell 2	Cell 3
		T1 T2 T3			T1-T3	T1-T3
E-UTRA RF Channel			1		1	1
Number						
BW _{channel}	MHz		10		10	10
Special subframe			6		6	6
configuration Note1						
Uplink-downlink			1		1	1
configuration ^{Note2}						
Correlation Matrix			2x2 Low		2x2 Low	2x2 Low
and Antenna						
Configuration						
OCNG Pattern						
defined in A.3.2.2.2			OP.2 TDD		OP.2 TDD	OP.2 TDD
(TDD)						
ρα, ρΒ			-3		-3	-3
PCFICH_RB	dB		11		Non-ABS and	Non-ABS and
PDCCH_RA	dB		1		ABS subframe	ABS subframe
PDCCH_RB	dB		1		channel powers	channel powers
PBCH_RA	dB				defined in Table	defined in Table
PBCH_RB	dB				A.3.4.1.2-1.	A.3.4.1.2-1.
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB		-3			
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note1}	dB					
OCNG_RB ^{Note1}	dB					
SNR Note 6	dB	-1.5	-5.2	-13.7	4	2
N_{oc}	dBm/15		-98		-98	-98
	kHz					
Propagation condition			ETU 30 Hz	-	ETU 30 Hz	ETU 30 Hz

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink subframe configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs
- Note 8: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in Figure A.7.3.18.1-1.

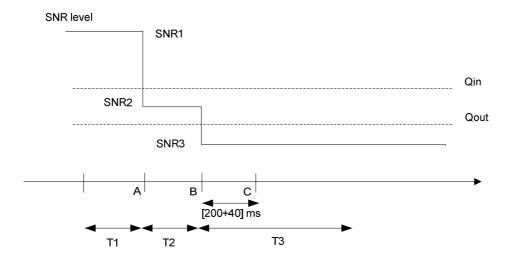


Figure A.7.3.18.1-1 SNR variation for out-of-sync testing

A.7.3.18.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

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

A.7.3.19 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resouce Restriction with CRS assistance information and Non-MBSFN ABS

A.7.3.19.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in section 7.6.

The test parameters are given in Tables A.7.3.19.1-1 and A.7.3.19.1-2 below. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and 3 are the neighbour cells. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.19.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2 and Cell 3, which shall be valid during T1, T2, T3, T4 and T5 in this test. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

Table A.7.3.19.1-1: General test parameters for E-UTRAN FDD in-sync radio link monitoring test

Para	meter	Unit		Value		Comment	
				Test 1			
PCFICH/PDC	CH/PHICH		Cell 1 R.9 FDD	Cell 2 R.9 FDD	Cell 3 R.9 FDD	As specified in section	
parameters						A.3.1.2.1. None of the PDCCH are intended for the UE under test	
OCNG parame	eters		OP.6 FDD	OP.6 FDD	OP.6 FDD	As specified in section A.3.2.1.6.	
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1	
CP length			Normal	Normal	Normal		
E-UTRA RF C	hannel Number		1	1	1	One E-UTRA FDD carrier frequency is used.	
E-UTRA Chan (BW _{channel})		MHz	10	10	10		
Correlation Ma Antenna Confi	guration		2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2	
Neighbor Cell configuration	ABS		N/A	Non-MBSFN A	ABS	As defined in Table A.3.4.1.2-2	
ABS Pattern			N/A	'10000001 000000100 0 0000100000 001000000	'10000001 000000100 0 0000100000 001000000	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are cofigured in the ABS subframes. Configured in both Cell 2 and Cell 3 prior to the start of T1.	
Time domain r resource restri	ction pattern		'10000001 000000100 000010000 0001000000 0'	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCe II-r10 as defined in TS 36.331, clause 6.3.2.	
CRS assistant	physCellId		N/A	see PCI conditions	see PCI conditions	The CRS assistance information is provided for	
information	antennaPorts Count		1	below an2	below an2	Cell 2 and Cell 3 in CRS- AssistanceInfo. It includes a single MBSFN-	
	mbsfn- SubframeCo nfigList			oneFrame = '000000'	oneFrame = '000000'	SubframeConfig element with subframe allocation oneFrame='000000'	
Time offset be (With respect t	tween cells	us	0	3	2		
	ft between cells	Hz	0	300	-100		
Physical Cell I			PCI _{cell1}	(PCI _{cell1} - PCI _{cell2}) mod3 = 0, PCI _{cell1} not equal to	(PCI _{cell1} - PCI _{cell3}) mod3! = 0	Cell PCIs are selected so that all conditions are met	

				PCI _{cell2}			
In sync transmis	sion	DCI	1C	1C	1C		
parameters (Not		format					
In sync transmission	Number of Control OFDM symbols		3	3	3	As defined in section 5.3.3.1.4 in TS 36.212	
parameters (Note 1)	Aggregatio n level	CCE	4	4	4	In sync threshold Q _{in} and the corresponding	
	ρ _Α , ρ _Β		-3	-3	-3	hypothetical	
	Ratio of PDCCH to RS EPRE		-3	Non-ABS and subframe cha defined in Tab		PDCCH/PCFICH transmission parameters are as specified in section	
	Ratio of PCFICH to RS EPRE		1			and Table 7.6.1-2 respectively.	
	DCI format		1A	1A	1A		
Out of sync transmission parameters	Number of Control OFDM symbols		3	3	3	As defined in section 5.3.3.1.3 in TS 36.212	
(Note 1)	Aggregatio n level	CCE	8	8	8	Out of sync threshold Q _{out} and the corresponding	
	ρа, ρв		-3	-3	-3	hypothetical	
	Ratio of PDCCH to RS EPRE	dB	1	Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.2-2.		PDCCH/PCFICH transmission parameters are as specified in section 7.6.1 and Table 7.6.1-1 respectively.	
	Ratio of PCFICH to RS EPRE	dB	1				
DRX			OFF	OFF	OFF		
Layer 3 filtering			Enabled	Disable	Disable	Counters: N310 = 1; N311 = 1	
T310 timer		ms	2000	N/A	•	T310 is enabled	
T311 timer		ms	1000			T311 is enabled	
Periodic CQI reporting mode CQI reporting periodicity			PUCCH 1-0			As defined in table 7.2.2-1 in TS 36.213.	
		ms	2			Minimum CQI reporting periodicity	
T1		S	0.5	N/A			
T2		S	0.4				
T3		S	1.46				
T4		S	0.4				
T5		S	1				

Table A.7.3.19.1-2: Cell specific test parameters for E-UTRAN FDD in-sync radio link monitoring test

Parameter	Unit	Test 1						
		Cell1			Cell2	Cell3		
		T1	T2	Т3	T4	T5	T1-T5	T1-T5
E-UTRA RF Channel				1			1	1
Number								
BW _{channel}	MHz			10			10	10
Correlation Matrix				2x2 Low			2x2 Low	2x2 Low
and Antenna								
Configuration								
PCFICH/PDCCH/PHI				R.9 FDD			R.9 FDD	R.9 FDD
CH parameters								
OCNG Pattern								
defined in A.3.2.1				OP.6 FDD)		OP.6 FDD	OP.6 FDD
(FDD)								
ρα, ρв				-3			-3	-3
PCFICH_RB	dB			1				ABS subframe
PDCCH_RA	dB							ers defined in
PDCCH_RB	dB						Table A.	3.4.1.2-2.
PBCH_RA	dB							
PBCH_RB	dB			_				
PSS_RA	dB			-3				
SSS_RA	dB							
PHICH_RA	dB							
PHICH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG RB ^{Note 1}	dB							
SNR Note 6	dB	-1.5	-5.2	-13.7	-8.6	-1.5	4	2
N	dBm/15			-98			-98	-98
N_{oc}	kHz							
Propagation condition	Hz			ETU 30			ETU 30	ETU 30
11 4 4 00110 1 11					, ,,			

- Note 1: OCNG shall be used such that the resources in cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.19.1-1.

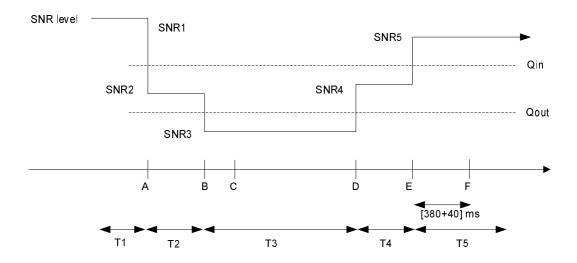


Figure A.7.3.19.1-1 SNR variation for in-sync testing

A.7.3.19.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.20 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resouce Restriction with CRS assistance information and Non-MBSFN ABS

A.7.3.20.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in section 7.6.

The test parameters are given in Tables A.7.3.20.1-1 and A.7.3.20.1-2 below. There are three active cells in the test: Cell 1 is the PCell and Cell 2 and 3 are the Neighbor cells. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.20.1-1 shows the variation of the downlink SNR in the PCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2 and Cell 3, which shall be valid during T1, T2, T3, T4 and T5 in this test. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

Table A.7.3.20.1-1: General test parameters for E-UTRAN TDD in-sync radio link monitoring test

Parameter		Unit				Comment	
			Test 1				
			Cell 1	Cell 2	Cell 3		
PCFICH/PDCC parameters			R.9 TDD	R.9 TDD	R.9 TDD	As specified in section A.3.1.2.2. None of the PDCCH are intended for the UE under test	
OCNG parame	eters		OP.2 TDD	OP.2 TDD	OP.2 TDD	As specified in section A.3.2.2.2.	
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1	
CP length			Normal	Normal	Normal		
E-UTRA RF CI	hannel Number		1	1	1	One E-UTRA TDD carrier frequency is used.	
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	10	10		
Correlation Matrix and Antenna Configuration			2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2	
Neighbor Cell of configuration	ABS		N/A	Non-MBSFN ABS		As defined in Table A.3.4.1.2-1	
ABS Pattern			N/A	'000010000 0000010000 0'	'000010000 0000010000 0'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2 and Cell 3. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.	
Time domain measurement resource restriction pattern			'000010000 0000010000 0'	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCe II-r10 as defined in TS 36.331, clause 6.3.2.	
CRS assistant	physCellId		N/A	see PCI conditions	see PCI conditions	The CRS assistance information is provided for	
information				below	below	Cell 2 and Cell 3 in CRS-	
	antennaPorts Count			an2	an2	AssistanceInfo. It includes a single MBSFN-	
	mbsfn- SubframeCo nfigList			oneFrame = '000000'	oneFrame = '000000'	SubframeConfig element with subframe allocation oneFrame='000000'	
Time offset from Cell 1		us	0	3	2		
Frequency offset Physical Cell ID		Hz	PCI _{cell1}	300 (PCI _{cell1} - PCI _{cell2}) mod3 = 0, PCI _{cell1} not equal to PCI _{cell2}	-100 (PCI _{cell1} - PCI _{cell3}) mod3! = 0	Cell PCIs are selected so that all conditions are met	

	DCI format		1C	1C	1C	As defined in section 5.3.3.1.4 in TS 36.212
In sync transmission parameters	Number of Control OFDM symbols		3	3	3	In sync threshold Q _{in} and the corresponding hypothetical PDCCH/PCFICH
(Note 1)	Aggregatio n level	CCE	4	4	4	transmission parameters are as specified in section
	ρ _A , ρ _B		-3	-3	-3	and Table 7.6.1-2
	Ratio of PDCCH to RS EPRE		-3	Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.2-2.		respectively.
	Ratio of PCFICH to RS EPRE		1			
	DCI format		1A	1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
Out of sync transmission parameters (Note 1)	Number of Control OFDM symbols		3	3	3	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH
	Aggregatio n level	CCE	8	8	8	transmission parameters are as specified in section
	ρ _A , ρ _B		-3	-3	-3	7.6.1 and Table 7.6.1-1
Ratio of PDCCH to RS EPRE		dB	1	Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.2-2.		respectively.
	Ratio of PCFICH to RS EPRE	dB	1			
DRX	<u> </u>		OFF	OFF	OFF	
Layer 3 filtering			Enabled	Disable	Disable	Counters: N310 = 1; N311 = 1
T310 timer	T310 timer		2000	N/A	•	T310 is enabled
T311 timer		ms	1000			T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0			As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1			Minimum CQI reporting periodicity
T1		S	0.5	N/A		
T2		S	0.4			
T3		S	1.46			
T4		S	0.4			
T5		S	1			

Table A.7.3.20.1-2: Cell specific test parameters for E-UTRAN TDD in-sync radio link monitoring test

Parameter	Unit	Test 1					
		Cell1	Cell2 Cell3				
		T1 T2 T3 T4 T	5 T1-T5 T1-T5				
E-UTRA RF Channel		1	1 1				
Number							
BW _{channel}	MHz	10	10 10				
Correlation Matrix		2x2 Low	2x2 Low 2x2 Low				
and Antenna							
Configuration							
Special subframe		6	6 6				
configuration Note 1							
Uplink-downlink		1	1 1				
configuration Note 2							
PCFICH/PDCCH/PHI		R.9 TDD	R.9 TDD R.9 TDD				
CH parameters							
OCNG Pattern							
defined in A.3.2.2		OP.2 TDD	OP.2 TDD OP.2 TDD				
(TDD)							
ρΑ, ρΒ		-3	-3 -3				
PCFICH_RB	dB	1	Non-ABS and ABS subframe				
PDCCH_RA	dB		channel powers defined in				
PDCCH_RB	dB		Table A.3.4.1.2-2.				
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB	-3					
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 3}	dB						
OCNG_RB ^{Note 3}	dB						
SNR Note 8	dB	-1.5 -5.2 -13.7 -8.6 -1	.5 4 2				
N_{oc}	dBm/15	-98	-98 -98				
	kHz						
Propagation condition	Hz	ETU 30	ETU 30 ETU 30				
Note 4. For the appoint subfrage configuration and table 4.2.4 in 2CDD TC 2C 244							

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.

SNR4 and SNR5 respectively in figure A.7.3.20.1-1.

Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.

Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.

Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.

Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.

Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.

Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of active cell is denoted as SNR1, SNR2, SNR3,

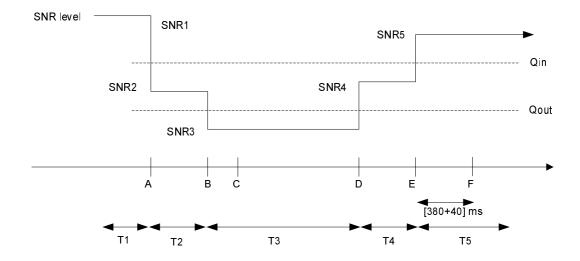


Figure A.7.3.20.1-1 SNR variation for in-sync testing

A.7.3.20.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.21 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resouce Restriction with CRS assistance information and MBSFN ABS

A.7.3.21.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information and MBSFN ABS. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in section 7.6.

The test parameters are given in Tables A.7.3.21.1-1 and A.7.3.21.1-2 below. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and 3 are the neighbour cells. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.21.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2 and Cell 3, which shall be valid during T1, T2, T3, T4 and T5 in this test. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

Table A.7.3.21.1-1: General test parameters for E-UTRAN FDD in-sync radio link monitoring test

Parameter		Unit		Value	Comment	
			Test 1		0 !! 0	
PCFICH/PDCCH/PHICH parameters			Cell 1 R.9 FDD	Cell 2 R.9 FDD	Cell 3 R.9 FDD	As specified in section
parameters						A.3.1.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	OP.9 FDD	OP.9 FDD	As specified in section A.3.2.1.
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	
E-UTRA RF C	Channel Number		1	1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Char (BW _{channel})	nnel Bandwidth	MHz	10	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
Neighbor Cell configuration	ABS		N/A	MBSFN ABS		As defined in Table A.3.4.2.2-2
ABS Pattern			N/A	'01000001 000000100 000000100 0000100000 0'	'010000001 0000000100 000000100 0000100000 0'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. MBSFN subframes are cofigured in the ABS subframes configured in Cell 2 and Cell 3 prior to the start of T1.
Time domain measurement resource restriction pattern			'010000001 000000100 000000100 0000100000 0'	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCe II-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistance information	physCellId		N/A	see PCI conditions below	see PCI conditions below	The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-
	antennaPorts Count			an2	an2	AssistanceInfo. It includes a single MBSFN-
	mbsfn- SubframeCo			fourFrames	fourFrames =	SubframeConfig element with subframe allocation
	nfigList			'100001000 1000001000 01000'	'100001000 1000001000 01000'	fourFrames = '1000010000100001 000'
Time offset between cells (With respect to Cell 1)		us	0	3	2	
Frequency shift between cells (With respect to Cell 1)		Hz	0	300	-100	
Physical Cell ID			PCI _{cell1}	(PCI _{cell1} - PCI _{cell2}) mod3 = 0,	(PCI _{cell1} - PCI _{cell3}) mod3 != 0	Cell PCIs are selected so that all conditions are met

		1		DOI :	1	T	
				PCI _{cell1} not			
				equal to			
				PCI _{cell2}			
In sync transmis		DCI	1C	1C	1C		
parameters (No		format					
	Number of		3	3	3	As defined in section	
	Control					5.3.3.1.4 in TS 36.212	
In sync	OFDM						
transmission	symbols						
parameters	Aggregatio	CCE	4	4	4	In sync threshold Q _{in} and	
(Note 1)	n level					the corresponding	
	ρ _Α , ρ _Β		-3	-3	-3	hypothetical	
	Ratio of		-3	Non-ABS and	IABS	PDCCH/PCFICH	
	PDCCH to			subframe cha	nnel powers	transmission parameters	
	RS EPRE			defined in Tal	ole A.3.4.2.2-2.	are as specified in section	
	Ratio of		1			and Table 7.6.1-2	
	PCFICH to					respectively.	
	RS EPRE						
	DCI format		1A	1A	1A		
	Number of		3	3	3	As defined in section	
Out of sync	Control					5.3.3.1.3 in TS 36.212	
transmission	OFDM						
parameters	symbols						
(Note 1)	Aggregatio	CCE	8	8	8	Out of sync threshold Qout	
	n level					and the corresponding	
	ρα, ρв		-3	-3	-3	hypothetical	
	Ratio of	dB	1	Non-ABS and	IABS	PDCCH/PCFICH	
	PDCCH to			subframe cha	nnel powers	transmission parameters	
	RS EPRE			defined in Tal	ole A.3.4.2.2-2.	are as specified in section	
	Ratio of	dB	1			7.6.1 and Table 7.6.1-1	
	PCFICH to					respectively.	
	RS EPRE						
DRX			OFF	OFF	OFF		
Layer 3 filtering			Enabled	Disable	Disable	Counters:	
Layor o mioring			Liidolod	Dioabio	Dioabio	N310 = 1; N311 = 1	
T310 timer		ms	2000	N/A	1	T310 is enabled	
T311 timer		ms	1000	1 777		T311 is enabled	
	Periodic CQI reporting mode		PUCCH 1-0	†		As defined in table 7.2.2-1	
r enduic our reporting mode			1 2001110			in TS 36.213.	
CQI reporting periodicity		ms	2	†		Minimum CQI reporting	
- =	Car reporting periodicity		-			periodicity	
T1		S	0.5	N/A			
T2		S	0.4				
T3		S	1.46				
T4		S	0.4	1			
T5		s	1	†			
וט			1 .	1		1	

Table A.7.3.21.1-2: Cell specific test parameters for E-UTRAN FDD in-sync radio link monitoring test

Parameter	Test 1							
		Cell1			Cell2	Cell3		
		T1	T2	T3	T4	T5	T1-T5	T1-T5
E-UTRA RF Channel				1			1	1
Number								
BW _{channel}	MHz			10			10	10
Correlation Matrix				2x2 Low			2x2 Low	2x2 Low
and Antenna								
Configuration								
PCFICH/PDCCH/PHI				R.9 FDD			R.9 FDD	R.9 FDD
CH parameters								
OCNG Pattern								
defined in A.3.2.1				OP.6 FDE)		OP.9 FDD	OP.9 FDD
(FDD)								
ρΑ, ρΒ				-3			-3	-3
PCFICH_RB	dB			1				ABS subframe
PDCCH_RA	dB							ers defined in
PDCCH_RB	dB						Table A.	3.4.2.2-2.
PBCH_RA	dB							
PBCH_RB	dB			•				
PSS_RA	dB			-3				
SSS_RA	dB							
PHICH_RA	dB							
PHICH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
SNR Note 6	dB	-1.5	-5.2	-13.7	-8.6	-1.5	4	2
N_{oc}	dBm/15			-98			-98	-98
1 oc	kHz							
Propagation condition	Hz	ETU 30					ETU 30	ETU 30

- Note 1: OCNG shall be used such that the resources in cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.21.1-1.

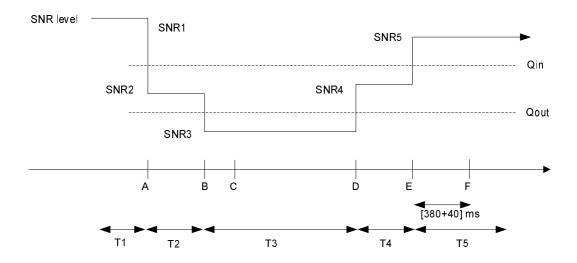


Figure A.7.3.21.1-1 SNR variation for in-sync testing

A.7.3.21.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.22 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resouce Restriction with CRS assistance information and MBSFN ABS

A.7.3.22.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in section 7.6.

The test parameters are given in Tables A.7.3.22.1-1 and A.7.3.22.1-2 below. There are three active cells in the test: Cell 1 is the PCell and Cell 2 and 3 are the Neighbor cells. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.22.1-1 shows the variation of the downlink SNR in the PCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2 and Cell 3, which shall be valid during T1, T2, T3, T4 and T5 in this test. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

Table A.7.3.22.1-1: General test parameters for E-UTRAN TDD in-sync radio link monitoring test

Parameter		Unit		Value		Comment	
				Test 1			
			Cell 1	Cell 2	Cell 3		
PCFICH/PDCCH/PHICH parameters			R.9 TDD	R.9 TDD	R.9 TDD	As specified in section A.3.1.2.2. None of the PDCCH are intended for the UE under test	
OCNG parame	eters		OP.2 TDD	OP.6 TDD	OP.6 TDD	As specified in section A.3.2.2.	
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1	
CP length			Normal	Normal	Normal		
	hannel Number		1	1	1	One E-UTRA TDD carrier frequency is used.	
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	10	10		
Correlation Ma Antenna Confi			2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2	
Neighbor Cell configuration	ABS		N/A	MBSFN ABS		As defined in Table A.3.4.2.2-1	
ABS Pattern			N/A	'000010000 0000010000 0'	'000010000 0000010000 0'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2 and Cell 3 The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod 20 = 0, where x is the size of the bit string (20) divided by 10. MBSFN subframes are configured in the ABS subframes.	
resource restri	Time domain measurement resource restriction pattern		'000010000 0000010000 0'	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCe II-r10 as defined in TS 36.331, clause 6.3.2.	
CRS	physCellId		N/A	see PCI	see PCI	The CRS assistance	
assistance				conditions	conditions	information is provided for	
information	antennaPorts			below an2	below an2	Cell 2 and Cell 3 in CRS- AssistanceInfo. It includes	
	Count	1	4	fourFrames	fourFrance	a single MBSFN-	
	mbsfn- SubframeCo nfigList			fourFrames = '010000100 0010000100 00000'	fourFrames = '010000100 0010000100 00000'	SubframeConfig element with subframe allocation fourFrames = '01000010000100001000010000 000'	
Time offset from Cell 1		us Hz	0	3	2		
	Frequency offset		0	300	-100		
Physical Cell ID			PCI _{cell1}	(PCI _{cell1} - PCI _{cell2}) mod3 = 0, PCI _{cell1} not equal to	(PCI _{cell1} - PCI _{cell3}) mod3 != 0	Cell PCIs are selected so that all conditions are met	

				PCI _{cell2}			
	DCI format		1C	1C	1C	As defined in section 5.3.3.1.4 in TS 36.212	
In sync transmission parameters	Number of Control OFDM symbols		2	2	2	In sync threshold Q _{in} and the corresponding hypothetical PDCCH/PCFICH	
(Note 1)	Aggregatio n level	CCE	4	4	4	transmission parameters are as specified in section	
	ρ _A , ρ _B		-3	-3	-3	and Table 7.6.1-2	
	Ratio of PDCCH to RS EPRE		-3	Non-ABS and subframe characteristics defined in Ta		respectively.	
	Ratio of PCFICH to RS EPRE		1				
	DCI format		1A	1A	1A	As defined in section 5.3.3.1.3 in TS 36.212	
Out of sync transmission parameters (Note 1)	Number of 2 2 2 2 Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH			
	Aggregatio n level	CCE	8	8	8	transmission parameters are as specified in section	
	ρ_A , ρ_B		-3	-3	-3	7.6.1 and Table 7.6.1-1	
	Ratio of PDCCH to RS EPRE	dB	1	Non-ABS and subframe characteristics defined in Ta		respectively.	
	Ratio of PCFICH to RS EPRE	dB	1				
DRX			OFF	OFF	OFF		
Layer 3 filtering			Enabled	Disable	Disable	Counters: N310 = 1; N311 = 1	
T310 timer		ms	2000	N/A	•	T310 is enabled	
T311 timer		ms	1000			T311 is enabled	
Periodic CQI reporting mode			PUCCH 1-0			As defined in table 7.2.2-1 in TS 36.213.	
CQI reporting periodicity		ms	1			Minimum CQI reporting periodicity	
T1		S	0.5	N/A			
T2		S	0.4				
T3		S	1.46				
T4		S	0.4				
T5		S	1				

Table A.7.3.22.1-2: Cell specific test parameters for E-UTRAN TDD in-sync radio link monitoring test

Parameter	Unit	Test 1	
		Cell1	Cell2 Cell3
		T1 T2 T3 T4 T5	T1-T5 T1-T5
E-UTRA RF Channel		1	1 1
Number			
BW _{channel}	MHz	10	10 10
Correlation Matrix		2x2 Low	2x2 Low 2x2 Low
and Antenna			
Configuration			
Special subframe		6	6 6
configuration Note 1			
Uplink-downlink		1	1 1
configuration Note 2			
PCFICH/PDCCH/PHI		R.9 TDD	R.9 TDD R.9 TDD
CH parameters			
OCNG Pattern			
defined in A.3.2.2		OP.2 TDD	OP.6 TDD OP.6 TDD
(TDD)			
ρΑ, ρΒ		-3	-3 -3
PCFICH_RB	dB	1	Non-ABS and ABS subframe
PDCCH_RA	dB		channel powers defined in
PDCCH_RB	dB		Table A.3.4.2.2-1.
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB	-3	
SSS_RA	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG RA ^{Note 3}	dB		
OCNG RB ^{Note 3}	dB		
SNR Note 8	dB	-1.5 -5.2 -13.7 -8.6 -1.5	4 2
	dBm/15	-98	-98 -98
N_{oc}	kHz		
Propagation condition	Hz	ETU 30	ETU 30 ETU 30
		#	

- Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of active cell is denoted as SNR1, SNR2, SNR3,
 - SNR4 and SNR5 respectively in figure A.7.3.22.1-1.

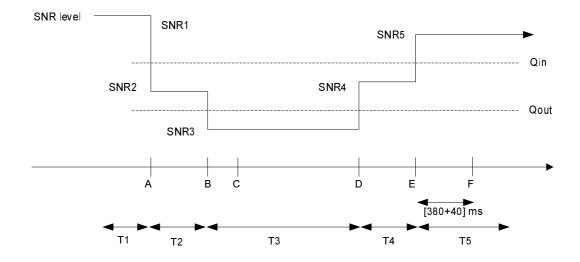


Figure A.7.3.22.1-1 SNR variation for in-sync testing

A.7.3.22.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth

A.7.3.23.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.7.3.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.7.3.23.1-1 and A.7.3.23.1-2 will replace the values of corresponding parameters in Test 4 in Tables A.7.3.1.1-1 and A.7.3.1.1-2. Only Test 4 is defined for the 5MHz bandwidth.

Table A.7.3.23.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under 5MHz

Bandwidth

Par	Parameter		Value	Comment
			Test 4	
PCFICH/PDC parameters	CH/PHICH		R.12 FDD	As specified in clause A.3.1.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.16 FDD	As specified in clause A.3.2.1.16.
E-UTRA Char (BW _{channel})	nnel Bandwidth	MHz	5	
Out of sync transmission parameters (Note 1)	Number of Control OFDM Symbols		3	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Note 2: See Table A.7.3.1.1-1 for other general test parameters.

Note 3: This test is according to the principle defined in section A.3.7.2.

Table A.7.3.23.1-2: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring test #4 under 5MHz Bandwidth

Parameter	Unit						
		T1	T2	T3			
BW _{channel}	MHz	5					
OCNG Pattern							
defined in A.3.2.1.16		(OP.16 FDD)			
(FDD)							
SNR Note 6	dB	-2.3	-5.7	-12.2			
Note 1: See Table A.7.3.1.1-2 for other cell specific test							
parameters.							

A.7.3.23.2 Test Requirements

The requirements defined in section A.7.3.1.2 shall apply to this test case.

A.7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth

A.7.3.24.1 Test Purpose and Environment

The purpose of this test case is the same as for the Test 2 defined in subclause A.7.3.2. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.7.3.24.1-1 and A.7.3.24.1-2 will replace the values of corresponding parameters in Tables A.7.3.2.1-1 and A.7.3.2.1-2.

Table A.7.3.24.1-1: General test parameters for E-UTRAN FDD in-sync testing

Par	Parameter		Value	Comment
PCFICH/PDCCH/PHICH parameters			R.12 FDD	As specified in clause A.3.1.2.1. None of the PDCCH are intended for the UE under test
E-UTRA Chani (BW _{channel})	nel Bandwidth	MHz	5	
In sync transmission parameters (Note 1) Number of Control OFDM symbols			3	In sync threshold Q _{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause and Table 7.6.1-2 respectively.
Out of sync transmission parameters (Note 1) Number of Control OFDM symbols Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause 7.6.1 and Tab. 7.6.1-1 respectively.				
			general test parameters. g to the principle defined in	section A.3.7.2

Table A.7.3.24.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring test

Parameter	Unit	T1	T2	Т3	T4	T5		
BW _{channel}	MHz	5						
OCNG Pattern								
defined in A.3.2.1.16			OP.16 FDD					
(FDD)								
SNR	dB	-2.3	-5.7	-12.2	-7.3	-2.3		
Propagation condition		ETU 70 Hz						
Note 1: See Table A.7.3.2.1-2 for other general test parameters.								

A.7.3.24.2 Test Requirements

The requirements defined in section A.7.3.2.2 shall apply to this test case.

A.7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth

A.7.3.25.1 Test Purpose and Environment

The purpose of this test case is the same as for the Test 2 defined in subclause A.7.3.6. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.7.3.25.1-1 and A.7.3.25.1-2 will replace the values of corresponding parameters in Tables A.7.3.6.1-1 and A.7.3.6.1-2.

Table A.7.3.25.1-1: General test parameters for E-UTRAN FDD in-sync testing

Pai	Parameter		Value	Comment
PCFICH/PDCCH/PHICH parameters			R.12 FDD	As specified in clause A.3.1.2.1. None of the PDCCH are intended for the UE under test
E-UTRA Cha (BW _{channel})	nnel Bandwidth	MHz	5	
In sync transmissio n parameters (Note 1)	Number of Control OFDM symbols		3	In sync threshold Q _{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause and Table 7.6.1-2 respectively.
Out of sync transmissio n parameters (Note 1)	Number of Control OFDM symbols		r general test parameters.	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.

Note 2: This test is performed according to the principle defined in section A.3.7.2

Table A.7.3.25.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring test

Parameter	Unit	T1	T2	Т3	T4	T5	
BW _{channel}	MHz	5					
OCNG Pattern defined in A.3.2.1.16 (FDD)		OP.16 FDD					
SNR	dB	-2.3	-5.7	-12.2	-7.3	-2.3	
Propagation condition		AWGN					
Note 1: See Table A.7.3.6.1-2 for other general test parameters.							

A.7.3.25.2 Test Requirements

The requirements defined in section A.7.3.6.2 shall apply to this test case.

A.7.3.26 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE Category 0

A.7.3.26.1 Test Purpose and Environment

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.26.1-1, A.7.3.26.1-2 and A.7.3.26.1-3 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.26.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Table A.7.3.26.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync testing for UE Category 0

Par	ameter	Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF C	hannel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	
CP length			Normal	
Out of sync	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
transmission parameters (Note 1)	Number of Control OFDM symbols		2	Out of sync threshold Qout and the corresponding
	Aggregation level	CCE	8	hypothetical PDCCH/PCFICH
	ρ _A , ρ _B		-3	transmission
	Ratio of PDCCH to RS EPRE	dB	4	parameters are as specified in section
	Ratio of PCFICH to RS EPRE	dB	1	7.11.1 and Table 7.11.1-1 respectively.
DRX			OFF	
Layer 3 filterin	g		Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI r		PUCCH 1- 0	As defined in table 7.2.2-1 in TS 36.213.	
CQI reporting	ms	2	Minimum CQI reporting periodicity	
T1		S	1	
T2		S	0.4	
T3		S	0.5	

Table A.7.3.26.1-2: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring tests for UE Category 0

Parameter	Unit	Test 1			
		T1	T2	Т3	
E-UTRA RF Channel			1		
Number					
BW _{channel}	MHz		10		
PCFICH/PDCCH/PHIC			R.7 FDD		
H parameters defined					
in A.3.1.2.1					
OCNG Pattern defined			OP.2 FDD		
in A.3.2.1 (FDD)					
ρα, ρв			-3		
PCFICH_RB	dB		1		
PDCCH_RA	dB		4		
PDCCH_RB	dB		4		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB		0		
PHICH_RA	dB		-3		
PHICH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
N_{oc}	dBm/15		-98		
	kHz				
SNR Note 6	dB	-2.1	-6.9	-12.9	
Propagation condition			ETU 70Hz		
Correlation Matrix and			2x1 Low		
Antenna Configuration Note 1: OCNG shall be				- all # 4	
are fully alloca spectral densit					
Note 2: The uplink res					
the UE prior to				1100 10	
Note 3: The timers and	laver 3 filte	ring related	d paramete	rs are	
	The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.				
	The signal contains PDCCH for UEs other than the				
	device under test as part of OCNG.				
	SNR levels correspond to the signal to noise ratio over				
the cell-specifi	e cell-specific reference signal REs.				
Note 6: The SNR in tin					
	SNR1, SNR2 and SNR3 respectively in figure				
A.7.3.26.1-1.					

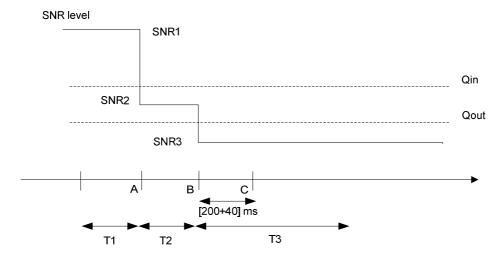


Figure A.7.3.26.1-1: SNR variation for out-of-sync testing

A.7.3.26.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

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

A.7.3.27 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE Category 0

A.7.3.27.1 Test Purpose and Environment

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FD-FDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.27.1-1 and A.7.3.27.1-2 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.27.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Table A.7.3.27.1-1: General test parameters for E-UTRAN FD-FDD in-sync testing for UE Category 0

Pai	rameter	Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF
				channel number 1
E-UTRA RF	Channel Number		1	One E-UTRA FDD carrier
E LITDA Cha	E-UTRA Channel Bandwidth		10	frequency is used.
(BW _{channel})	nnei Bandwidth	MHz	10	
CP length			Normal	
	DCI format		1C	As defined in
				clause 5.3.3.1.4 in TS
In sync transmissio	Number		2	36.212
ransmissio n	Number of Control OFDM		2	In sync threshold Q _{in} and the corresponding
parameters	symbols			hypothetical
(Note 1)	Aggregation	CCE	4	PDCCH/PCFICH
,	level	001	•	transmission parameters
	ρΑ, ρΒ		-3	are as specified in clause
	Ratio of PDCCH	dB	1	7.11.1 and Table 7.11.1-2
	to RS EPRE			respectively.
	Ratio of	dB	1	
	PCFICH to RS			
	EPRE DCI format		1A	As defined in
	Del Iolillat		IA	clause 5.3.3.1.3 in TS
Out of sync				36.212
transmissio	Number of		2	Out of sync threshold Qout
n	Control OFDM			and the corresponding
parameters	symbols			hypothetical
(Note 1)	Aggregation	CCE	8	PDCCH/PCFICH
	level		-3	transmission parameters are as specified in
	ρ _A , ρ _B Ratio of PDCCH	dB	-3 4	clause 7.11.1 and Table
	to RS EPRE	uБ	4	7.11.1-1 respectively.
	Ratio of	dB	1	┪ ' '
	PCFICH to RS		•	
	EPRE			
DRX			OFF	
Layer 3 filteri	ng		Enabled	Counters:
T210 timer			2000	N310 = 1; N311 = 1
T310 timer T311 timer		ms ms	2000 1000	T310 is enabled T311 is enabled
	reporting mode	1115	PUCCH 1-0	As defined in table 7.2.2-1
i criodic odi	Toporting House		1 00011 1-0	in TS 36.213.
CQI reporting	periodicity	ms	2	Minimum CQI reporting
	, ,			periodicity
T1		S	0.5	
T2		S	0.4	
T3		S	1.46	
T4		S	0.4	
T5	OCCH/DOFICH corre	S	1	out of sync transmission

Table A.7.3.27.1-2: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for in-sync radio link monitoring test for UE Category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel		1				
Number						
BW _{channel}	MHz			10		
PCFICH/PDCCH/PHICH				R.7 FDD	1	
parameters defined in						
clause A.3.1.2.1						
OCNG Pattern defined in			(OP.2 FDI)	
A.3.2.1 (FDD)						
ρ _A , ρ _B				-3		
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB			•		
PHICH_RA	dB			-3		
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RANote 1	dB					
OCNG_RB ^{Note 1}	dB					
N_{oc}	dBm/15 kHz			-98		
SNR Note 6	dB	-2.1	-6.9	-12.9	-7.1	-2.1
Propagation condition				ETU 70H	Z	
Correlation Matrix and Antenna Configuration		2x1 Low				

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.27.1-1.

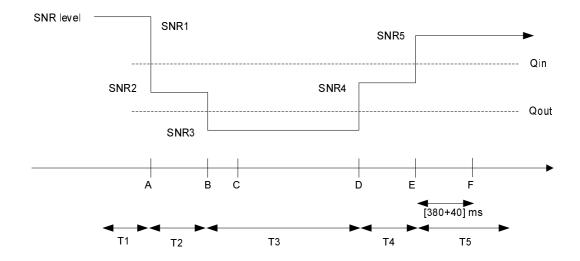


Figure A.7.3.27.1-1: SNR variation for in-sync testing

A.7.3.27.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.28 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0

A.7.3.28.1 Test Purpose and Environment

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FD-FDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.28.1-1, A.7.3.28.1-2, A.7.3.28.1-3 and A.7.3.28.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.28.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.28.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync tests in DRX for UE category 0

Para	ameter	Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF
				channel number 1
E-UTRA RF C	E-UTRA RF Channel Number		1	One E-UTRA FDD
				carrier frequency is
				used.
	nnel Bandwidth	MHz	10	
(BWchannel)			No was al	
CP length	DOI 4		Normal	A - define ed in
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS
Out of sync				36.212
transmission	Number of		2	Out of sync threshold
parameters	Control OFDM			Qout and the
(Note 1)	symbols			corresponding
	Aggregation	CCE	8	hypothetical
	level			PDCCH/PCFICH
	ρΑ, ρΒ		-3	transmission parameters
	Ratio of	dB	4	are as specified in clause 7.11.1 and Table
	PDCCH to RS EPRE			7.11.1-1 respectively.
	Ratio of	dB	1	7.11.1 Prospectively.
	PCFICH to RS	uБ	'	
	EPRE			
DRX cycle		ms	1280	See Table A.7.3.28.1-3
Layer 3 filterin	ıg		Enabled	Counters:
				N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI r	Periodic CQI reporting mode		PUCCH 1-	As defined in table 7.2.2-
		ms	0	1 in TS 36.213.
CQI reporting	CQI reporting periodicity		2	Minimum CQI reporting
T4	T.		20	periodicity
T1 T2		S	32 12.8	
T3		S S	12.8	
13		১	10	

Table A.7.3.28.1-2: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit	Test 1			
		T1	T2	T3	
E-UTRA RF Channel			1		
Number					
BW _{channel}	MHz		10		
PCFICH/PDCCH/PHICH			R.7 FDD		
parameters defined in					
clause A.3.1.2.1					
OCNG Pattern defined in			OP.2 FDD		
A.3.2.1 (FDD)					
ρ _A , ρ _B			-3		
PCFICH_RB	dB		1		
PDCCH_RA	dB		4		
PDCCH_RB	dB		4		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PHICH_RA	dB	-3			
PHICH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note1}	dB				
OCNG_RB ^{Note1}	dB				
N_{oc}	dBm/15		-98		
	kHz				
SNR Note 6	dB	-6.1	-10.0	-14.0	
Propagation condition			AWGN		
Correlation Matrix and			2x1		
Antenna Configuration					
Note 1: OCNG shall be i					
are fully allocate					
spectral density					
Note 2: The uplink resou				ned to	
the UE prior to the					
	The timers and layer 3 filtering related parameters are				
	configured prior to the start of time period T1.				
	Note 4: The signal contains PDCCH for UEs other than the				
device under test as part of OCNG.					
Note 5: SNR levels correspond to the signal to noise ratio over					
the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as					
SNR1, SNR2 and SNR3 respectively in figure A.7.3.28.1-1.					

Table A.7.3.28.1-3: DRX-Configuration for E-UTRAN FD-FDD out-of-sync tests for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.7.3.28.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD out-of-sync testing for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS
rimeAlignmentrimer	minity	36.331
		For further information see
sr-ConfigIndex	0	clause 6.3.2 in TS 36.331 and
		section10.1 in TS 36.213.

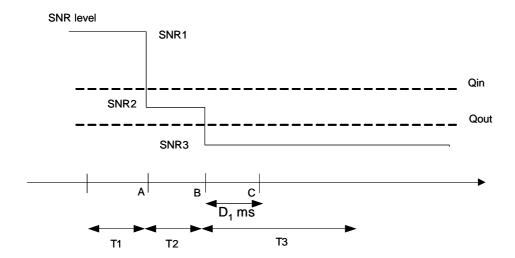


Figure A.7.3.28.1-1: SNR variation for out-of-sync testing in DRX

A.7.3.28.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration $D_1 = 6500$ ms after the start of time duration T3.

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

7.3.29 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category 0

7.3.29.1 Test Purpose and Environment

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FD-FDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables 7.3.29.1-1, 7.3.29.1-2, 7.3.29.1-3 and 7.3.29.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.29.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table 7.3.29.1-1: General test parameters for E-UTRAN FD-FDD in-sync test in DRX for UE category 0

P	arameter	Unit	Value	Comment	
Active cell			Cell 1	Cell 1 is on E-UTRA RF	
E LITOA DE C	hannel Number		1	channel number 1 One E-UTRA FDD carrier	
E-UTRA RE C	nannei Number		1		
E LIEDA Ob	and Described data	N 41 1-	10	frequency is used.	
E-UTRA Chan	nei Bandwidth	MHz	10		
(BW _{channel}) CP length			Normal		
CP length	DOI (As defined in alcose 5.0.04.4	
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212	
In sync	Number of Control		2	In sync threshold Q _{in} and the	
transmission	OFDM symbols			corresponding hypothetical	
parameters	Aggregation level	CCE	4	PDCCH/PCFĬCH	
(Note 1)	ρ _A , ρ _B		-3	transmission parameters are	
	Ratio of PDCCH to RS EPRE		1	as specified in clause 7.11.1 and Table 7.11.1-2	
	Ratio of PCFICH to RS EPRE		1	respectively.	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212	
Out of sync	Number of Control		2	Out of sync threshold Qout	
transmission	OFDM symbols			and the corresponding	
parameters	Aggregation level	CCE	8	hypothetical PDCCH/PCFICH	
(Note 1)	ρ _A , ρ _B		-3	transmission parameters are	
	Ratio of PDCCH to RS EPRE	dB	4	as specified in clause 7.11.1 and Table 7.11.1-1	
	Ratio of PCFICH to RS EPRE	dB	1	respectively.	
DRX cycle		ms	40	See Table 7.3.29.1-3	
Layer 3 filterin	g		Enabled	Counters: N310 = 1; N311 = 1	
T310 timer		ms	2000	T310 is enabled	
T311 timer		ms	1000	T311 is enabled	
Periodic CQI r	eporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.	
CQI reporting	periodicity	ms	2	Minimum CQI reporting periodicity	
T1		S	4	•	
T2		S	1.6		
T3		S	1.46		
T4		S	0.4		
T5		S	4		
Note 1. PDCCH/PCTICH corresponding to the in super and out of superfragation					

Table 7.3.29.1-2: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for in-sync radio link monitoring test in DRX for UE category 0

Parameter	Unit			Test 1		
		T1 T2 T3 T4 T5				
E-UTRA RF Channel Number				1		
BW _{channel}	MHz			10		
PCFICH/PDCCH/PHICH				R.7 FDD		
parameters defined in						
clause A.3.1.2.1						
OCNG Pattern defined in						
A.3.2.1 (FDD)				OP.2 FDD		
ρ _A , ρ _B				-3		
PCFICH_RB	dB			1		
PDCCH_RA	dB	1				
PDCCH_RB	dB			1		
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB			-3		
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note1}	dB					
OCNG_RB ^{Note1}	dB					
N_{oc}	dBm/15			-98		
	kHz		T		1	
SNR Note 8	dB	-6.1	-10.0	-14.0	-10.1	-6.1
Propagation condition				AWGN		
Correlation Matrix and		2x1				
Antenna Configuration						
Note 1: OCNG shall be used					l and a con	stant total
transmitted power spectral density is achieved for all OFDM symbols.						
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.						
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period						

- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and
 - SNR5 respectively in figure 7.3.29.1-1.

Table 7.3.29.1-3: DRX-Configuration for E-UTRAN FD-FDD out-of-sync tests for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.29.1-4: TimeAlignmentTimer -Configuration for E-UTRAN FD-FDD out-of-sync testing for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

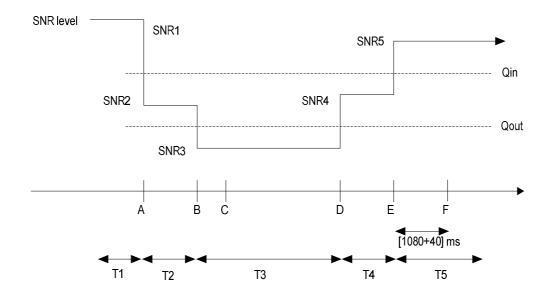


Figure 7.3.29.1-1: SNR variation for in-sync testing in DRX

7.3.29.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.30 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE Category 0

A.7.3.30.1 Test Purpose and Environment

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN HD-FDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.30.1-1, A.7.3.30.1-2 and A.7.3.30.1-3 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.30.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of [TBD] ms.

Table A.7.3.30.1-1: General test parameters for E-UTRAN HD-FDD out-of-sync testing for UE Category 0

Pa	rameter	Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA
				RF channel number 1
E-UTRA RF C	E-UTRA RF Channel Number		1	One E-UTRA FDD
				carrier frequency is
				used.
	nel Bandwidth	MHz	10	
(BW _{channel})				
CP length	T		Normal	
	DCI format		1A	As defined in section
				5.3.3.1.3 in TS
Out of sync				36.212
transmission	Number of		2	Out of sync threshold
parameters	Control OFDM			Q _{out} and the
(Note 1)	symbols			corresponding
	Aggregation level	CCE	8	hypothetical
	ρ _A , ρ _B		-3	PDCCH/PCFICH
	Ratio of PDCCH	dB	4	transmission
	to RS EPRE			parameters are as
	Ratio of PCFICH	dB	1	specified in section 7.11.1 and Table
	to RS EPRE			7.11.1 and Table 7.11.1-1 respectively.
DRX			OFF	7.11.1-1 respectively.
Layer 3 filterin	α		Enabled	Counters:
Layer 3 lillerin	g		Enabled	N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
	enorting mode	1110	PUCCH 1-0	As defined in table
Periodic CQI reporting mode			1 0001110	7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	[TBD]	Minimum CQI
				reporting periodicity
T1		S	1	
T2		S	0.4	
T3		S	0.5	
Note 1: PD	CCH/PCFICH corres		to the out of syr	

Table A.7.3.30.1-2: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for out-of-sync radio link monitoring for UE Category 0

Parameter	Unit	Test 1				
		T1 T2 T3				
E-UTRA RF Channel		1				
Number						
BW _{channel}	MHz	10				
PCFICH/PDCCH/PHIC		R.4 HD-FDD				
H parameters defined						
in section A.3.1.2.3						
OCNG Pattern defined						
in A.3.2.1 (FDD)		OP.2 FDD				
ρ_A , ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	4				
PDCCH_RB	dB	4				
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB	_				
PHICH_RA	dB -3					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N_{oc}	dBm/15	-98				
	kHz					
SNR Note 6	dB	-1.2 -6.0 -12.0				
Propagation condition		ETU 70Hz				
Correlation Matrix and		2x1 Low				
Antenna Configuration						
		that the resources in cell # 1				
	are fully allocated and a constant total transmitted power					
		for all OFDM symbols.				
	nk resources for CQI reporting are assigned to					
	UE prior to the start of time period T1.					
	The timers and layer 3 filtering related parameters are					
	nfigured prior to the start of time period T1.					
Note 4: The signal cor	contains PDCCH for UEs other than the					
	under test as part of OCNG.					
	orrespond to the signal to noise ratio over ific reference signal REs.					
		ignal REs. 1, T2 and T3 is denoted as				
		spectively in figure A.7.3.30.1-				
SINK I, SINK 2	anu SINKS 18	spectively in figure A.7.3.30.1-				

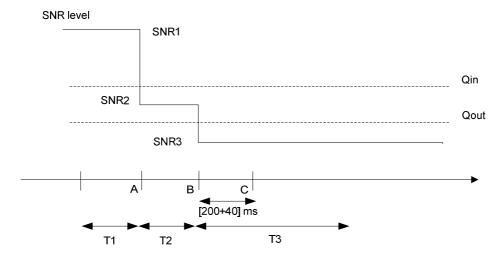


Figure A.7.3.30.1-1: SNR variation for out-of-sync testing

A.7.3.30.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

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

A.7.3.31 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE Category 0

A.7.3.31.1 Test Purpose and Environment

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN HD-FDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.31.1-1 and A.7.3.31.1-2 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.31.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of [TBD] ms.

Table A.7.3.31.1-1: General test parameters for E-UTRAN HD-FDD in-sync testing

Parameter		Unit	Value	Comment
Active cell	Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF	E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Cha (BW _{channel})	nnel Bandwidth	MHz	10	
CP length			Normal	
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
In sync transmissio	Number of Control OFDM symbols		2	In sync threshold Q _{in} and the corresponding hypothetical
n	Aggregation level	CCE	4	PDCCH/PCFICH transmission
parameters	ρΑ, ρΒ		-3	parameters are as specified in
(Note 1)	Ratio of PDCCH to RS EPRE	dB	1	clause 7.11.1 and Table 7.11.1-2 respectively.
	Ratio of PCFICH to RS EPRE	dB	1	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync transmissio	Number of Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding
n	Aggregation level	CCE	8	hypothetical PDCCH/PCFICH
parameters	ρΑ, ρΒ		-3	transmission parameters are
(Note 1)	Ratio of PDCCH to RS EPRE	dB	4	as specified in clause 7.11.1 and Table 7.11.1-1
	Ratio of PCFICH to RS EPRE	dB	1	respectively.
DRX			OFF	
Layer 3 filteri	ng		Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	[TBD]	Minimum CQI reporting periodicity
T1		S	0.5	
T2		S	0.4	
T3		S	1.46	
T4		S	0.4	
T5	T5		1	

Table A.7.3.31.1-2: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for in-sync radio link monitoring test for UE category 0

Parameter	er Unit		Test 1				
		T1	T2	T3	T4	T5	
E-UTRA RF Channel Number			1				
BW _{channel}	MHz			10			
PCFICH/PDCCH/PHICH				R.4 HD-FD	D		
parameters defined in							
clause A.3.1.2.3							
OCNG Pattern defined in							
A.3.2.1 (FDD)				OP.2 FDD	<u> </u>		
ρ _Α , ρ _Β				-3			
PCFICH_RB	dB			1			
PDCCH_RA	dB			1			
PDCCH_RB	dB			1			
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB			-3			
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
N_{oc}	dBm/15			-98			
	kHz						
SNR Note 6	dB	-1.2	-6.0	-12.0	-6.2	-1.2	
Propagation condition				ETU 70Hz		•	
Correlation Matrix and		2x1 low					
Antenna Configuration							

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.31.1-1.

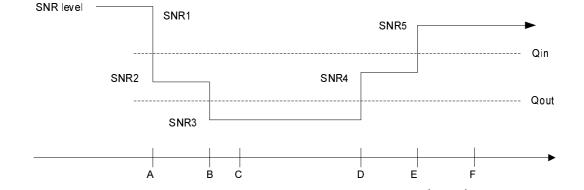


Figure A.7.3.31.1-1: SNR variation for in-sync testing

[380+40] ms

A.7.3.31.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.32 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0

A.7.3.32.1 Test Purpose and Environment

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN HD-FDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.32.1-1, A.7.3.32.1-2, A.7.3.32.1-3 and A.7.3.32.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.32.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.32.1-1: General test parameters for E-UTRAN HD-FDD out-of-sync tests in DRX for UE category 0

		Cell 1	O-II 4 is an ELITOA DE
		Cell I	Cell 1 is on E-UTRA RF
			channel number 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier
			frequency is used.
Bandwidth	MHz	10	
		Normal	
CI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
		2	Out of sync threshold Qout
			and the corresponding
gregation level	CCE		hypothetical PDCCH/PCFICH
'		_	transmission parameters are
	dB	4	as specified in clause 7.11.1
			and Table 7.11.1-1
	dB	1	respectively.
SEPRE			
	ms		See Table A.7.3.32.1-3
		Enabled	Counters:
			N310 = 1; N311 = 1
	ms	•	T310 is disabled
	ms		T311 is enabled
rting mode		PUCCH 1-0	As defined in table 7.2.2-1 in
			TS 36.213.
CQI reporting periodicity		5	Minimum CQI reporting
			periodicity
		<u> </u>	
	S		
	_		
		CI format Imber of Control FDM symbols Iggregation level CCE In, pB Intio of PDCCH to BEPRE Intio of PCFICH to BEPRE Int	Normal 1A

Table A.7.3.32.1-2: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit		Test 1		
		T1	T2	T3	
E-UTRA RF Channel			1		
Number					
BW _{channel}	MHz		10		
PCFICH/PDCCH/PHICH		F	R.4 HD-FDI)	
parameters specified in					
clause A.3.1.2.3					
OCNG Pattern defined in			OP.2 FDD		
A.3.2.1 (FDD)					
ρ _A , ρ _B			-3		
PCFICH_RB	dB		1		
PDCCH_RA	dB		4		
PDCCH_RB	dB		4		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB		2		
PHICH_RA	dB		-3		
PHICH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note1}	dB				
OCNG_RB ^{Note1}	dB				
N_{oc}	dBm/15		-98		
SNR Note 6	kHz	<i>5</i> 4	0.5	40.5	
	dB	-5.4	-9.5	-13.5	
Propagation condition Correlation Matrix and			AWGN		
Antenna Configuration			2x1		
Note 1: OCNG shall be	ucod cuch :	that the rec	ources in	ooll # 1	
are fully allocate					
spectral density					
Note 2: The uplink resor					
				1100 10	
	the UE prior to the start of time period T1. The timers and layer 3 filtering related parameters are				
configured prior					
				he	
	Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.				
	·				
	the cell-specific reference signal REs.				
Note 6: The SNR in time	e periods T	1, T2 and T			
SNR1, SNR2 ar	nd SNR3 re	spectively i	in figure A.	7.3.32.1-	
1.					

Table A.7.3.32.1-3: DRX-Configuration for E-UTRAN HD-FDD out-of-sync test for UE category 0

Field	Value	Comment
onDurationTimer	psf5	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.7.3.32.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD out-of-sync testing for UE category 0

Field	Value	Comment
TimeAlianmentTimer	infinity	As specified in clause 6.3.2 in TS
TimeAlignmentTimer	ппппц	36.331
		For further information see
sr-ConfigIndex	0	clause 6.3.2 in TS 36.331 and
_		section10.1 in TS 36.213.

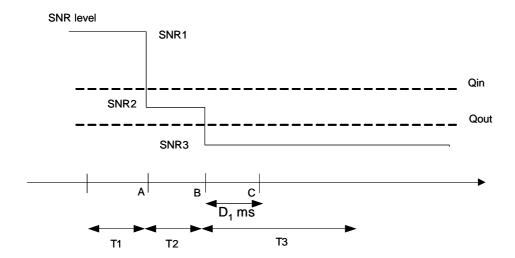


Figure A.7.3.32.1-1: SNR variation for out-of-sync testing in DRX

A.7.3.32.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration $D_1 = 6500$ ms after the start of time duration T3.

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

A.7.3.33 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category 0

A.7.3.33.1 Test Purpose and Environment

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN HD-FDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.33.1-1, A.7.3.33.1-2, A.7.3.33.1-3 and A.7.3.33.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.33.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.33.1-1: General test parameters for E-UTRAN HD-FDD in-sync test in DRX for UE category 0

Pa	rameter	Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Chani (BW _{channel})	nel Bandwidth	MHz	10	qy
CP length			Normal	
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
In sync transmission	Number of Control OFDM symbols		2	In sync threshold Q _{in} and the corresponding hypothetical
parameters (Note 1)	Aggregation level	CCE	4	PDCCH/PCFICH transmission parameters are as specified in
	ρ _Α , ρ _Β		-3	clause7.11.1 and Table 7.11.1- 2 respectively.
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync transmission	Number of Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding hypothetical
parameters (Note 1)	Aggregation level	CCE	8	PDCCH/PCFICH transmission parameters are as specified in
	ра, рв		-3	clause 7.11.1 and Table 7.11.1- 1 respectively.
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	40	See Table A.7.3.33.1-3
Layer 3 filtering	g		Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
	Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
	CQI reporting periodicity		5	Minimum CQI reporting periodicity
T1			4	
T2		S	1.6	
T3		S	1.46	
T4		S	0.4	
T5 s 4 Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission				

Table A.7.3.33.1-2: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for in-sync radio link monitoring test in DRX for UE category 0

E-UTRA RF Channel Number		T4				
E LITEA DE Channal Number		T1	T2	T3	T4	T5
E-UTRA KE Channel Number		1				
BW _{channel}	MHz			10		
PCFICH/PDCCH/PHICH				R.4 HD-FD	D	
parameters specified in						
clause A.3.1.2.3						
OCNG Pattern defined in				OP.2 FDD	1	
A.3.2.1 (FDD)						
ρ _A , ρ _B				-3		
PCFICH_RB	dB			1		
PDCCH_RA	dB			1		
PDCCH_RB	dB			1		
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB			-3		
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note1}	dB					
OCNG_RB ^{Note1}	dB					
N_{oc}	dBm/15			-98		
	kHz				1	
SNR Note 6	dB	-5.4	-9.5	-13.5	-9.4	-5.4
Propagation condition				AWGN		
Correlation Matrix and				2x1		
Antenna Configuration						
Note 1: OCNG shall be used					d and a con	stant total
transmitted power sp						
Note 2: The uplink resources Note 3: The timers and laver						

- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and
 - SNR5 respectively in figure A.7.3.33.1-1.

Table A.7.3.33.1-3: DRX-Configuration for E-UTRAN HD-FDD out-of-sync test for UE category 0

Field	Value	Comment
onDurationTimer	psf5	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table A.7.3.33.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD out-of-sync testing for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

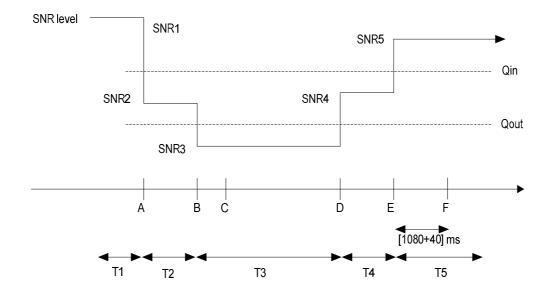


Figure A.7.3.33.1-1: SNR variation for in-sync testing in DRX

A.7.3.33.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.34 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE Category 0

A.7.3.34.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.34.1-1, A.7.3.34.1-2 and A.7.3.34.1-3 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.34.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Table A.7.3.34.1-1: General test parameters for E-UTRAN TDD out-of-sync testing for UE Category 0

Par	ameter	Unit	Value	Comment
Active cell	Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	
CP length			Normal	
Out of sync	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
transmission parameters (Note 1)	Number of Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding
	Aggregation level	CCE	8	hypothetical PDCCH/PCFICH
	ρ _A , ρ _B		-3	transmission
	Ratio of PDCCH to RS EPRE	dB	4	parameters are as specified in section
	Ratio of PCFICH to RS EPRE	dB	1	7.11.1 and Table 7.11.1-1 respectively.
DRX			OFF	
Layer 3 filterin	g		Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		S	1	
T2		S	0.4	
T3		S	0.5	
Nata 4. DD	COLUDOFICIA SAME			

Table A.7.3.34.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring for UE Category 0

Parameter		Unit	Test 1			
			T1	T2	Т3	
E-UTRA RF Channel				1		
Number						
BW _{channel}		MHz	10			
Special subframe			6			
configuration Note 1						
Uplink-downlink			1			
configuration Note 1						
PCFICH/PDCCH/PHIC			R.7 TDD			
H parameters defined						
in section A.3.1.2.2						
OCNG Pattern defined			00 6 700			
in A.3.2.2 (TDD)			OP.2 TDD			
ρ _Α , ρ _Β		-ID	-3			
PCFICH_RB		dB	1			
PDCCH_RA		dB	4			
PDCCH_RB		dB		4		
PBCH_RA		dB				
PBCH_RB		dB	-3			
PSS_RA		dB				
SSS_RA		dB				
PHICH_RA PHICH_RB		dB dB				
PDSCH_RA		dB dB				
PDSCH_RB		dB				
OCNG_RA ^{Note 2}		dB				
OCNG_RB ^{Note 2}		dB dB				
		dBm/15	-98			
N_{oc}		kHz				
SNR Note 7		dB	-1.6	-5.9	-11.9	
Propagation condition		u d D	1.0	ETU 70Hz	11.0	
Correlation Matrix and				2x1 Low		
Antenna Configuration				ZXI LOW		
Note 1: For special subframe and uplink-downlink configuration					ırations	
14010 1.	see Tables 4.2-1 and 4.2-2 in TS 36.211.					
Note 2:	OCNG shall be used such that the resources in cell # 1					
11010 2.	are fully allocated and a constant total transmitted power					
	spectral density is achieved for all OFDM symbols.					
Note 3: The uplink resources for CQI reporting are assigned					ned to	
	the UE prior to the start of time period T1.					
Note 4:			ering related parameters are			
	configured prior to the start of time period T1.					
Note 5:		signal contains PDCCH for UEs other than the				
		device under test as part of OCNG.				
Note 6:	SNR levels correspond to the signal to noise ratio over					

the cell-specific reference signal REs.

The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.34.1-

Note 7:

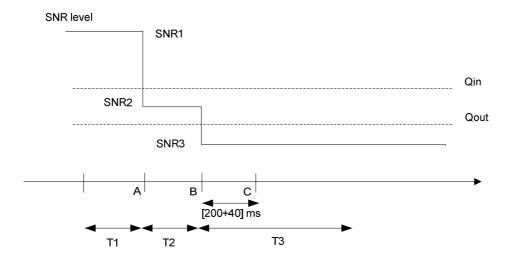


Figure A.7.3.34.1-1: SNR variation for out-of-sync testing

A.7.3.34.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of the time duration T3).

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

A.7.3.35 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0

A.7.3.35.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.35.1-1 and A.7.3.35.1-2 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.35.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Table A.7.3.35.1-1: General test parameters for E-UTRAN TDD in-sync testing

Pa	Parameter		Value	Comment		
			Test 1			
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1		
E-UTRA RF C	nannel Number		1	One E-UTRA TDD carrier frequency is used.		
E-UTRA Channel Bandwidth (BW _{channel})		MHz	10			
CP length			Normal			
In sync	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212		
transmission parameters	Number of Control OFDM symbols		2	In sync threshold Q _{in} and the corresponding		
(Note 1)	Aggregation level	CCE	4	hypothetical		
	ρ_A , ρ_B		-3	PDCCH/PCFICH		
Ratio of PDCCH to RS EPRE		dB	1	transmission parameters are as specified in clause 7.11.1		
	Ratio of PCFICH to RS EPRE	dB	1	and Table 7.11.1-2 respectively.		
Out of sync	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212		
transmission parameters	Number of Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding		
(Note 1)	Aggregation level	CCE	8	hypothetical		
	ρα, ρв		-3	PDCCH/PCFICH		
	Ratio of PDCCH to RS EPRE	dB	4	transmission parameters are as specified in clause 7.11.1		
	Ratio of PCFICH to RS EPRE	dB	1	and Table 7.11.1-1 respectively.		
DRX			OFF			
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1		
T310 timer		ms	2000	T310 is enabled		
T311 timer		ms	1000	T311 is enabled		
Periodic CQI re	Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.		
CQI reporting p	periodicity	ms	1	Minimum CQI reporting periodicity		
T1		S	0.5			
T2		S	0.4			
Т3		S	1.46			
T4		S	0.4			
T5		S	1			

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.35.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring test

Parameter	Unit			Test 1				
		T1	T2	T3	T4	T5		
E-UTRA RF Channel Number				1				
BW _{channel}	MHz	10						
Special subframe configuration Note 1		6						
Uplink-downlink configuration		1						
PCFICH/PDCCH/PHICH parameters defined in section A.3.1.2.2		R.7 TDD						
OCNG Pattern defined in A.3.2.2 (TDD)		OP.2 TDD						
ρ_A , ρ_B		-3						
PCFICH_RB	dB	1						
PDCCH_RA	dB	1						
PDCCH_RB	dB			1				
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PHICH_RA	dB	1		-3				
PHICH_RB	dB	1						
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 2}	dB							
OCNG_RB ^{Note 2}	dB							
N_{oc}	dBm/15 kHz	-98						
SNR Note 7	dB	-1.6	-5.9	-11.9	-6.6	-1.6		
Propagation condition				ETU 70Hz	1	.		
Correlation Matrix and Antenna Configuration		2x1 low						

- Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
- Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 7: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and
 - SNR5 respectively in figure A.7.3.35.1-1.

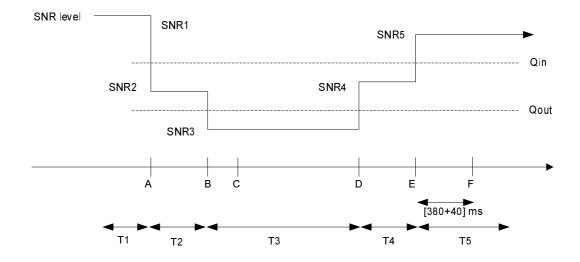


Figure A.7.3.35.1-1: SNR variation for in-sync testing

A.7.3.35.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.36 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0

A.7.3.36.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.36.1-1, A.7.3.36.1-2, A.7.3.36.1-3 and A.7.3.36.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.36.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.36.1-1: General test parameters for E-UTRAN TDD out-of-sync test in DRX for UE category 0

Parameter	Ur	nit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA
				RF channel number 1
E-UTRA RF Channel N	umber		1	One E-UTRA TDD
				carrier frequency is
				used.
E-UTRA Channel Band	width MH	ΗZ	10	
(BWchannel)			NI I	
CP length			Normal	A
DCI forr	nat		1A	As defined in
Out of owns				clause 5.3.3.1.3 in TS
Out of sync transmission Number	of		2	36.212 Out of sync threshold
parameters Control			2	Qout and the
(Note 1) symbols	-			corresponding
Aggrega		ìF.	8	hypothetical
level)_ 	O	PDCCH/PCFICH
ρΑ, ρΒ			-3	transmission
Ratio of	d	B	4	parameters are as
PDCCH			•	specified in
EPRE				clause 7.11.1 and
Ratio of	dl	В	1	Table 7.11.1-1
PCFICH	I to RS			respectively.
EPRE				
DRX cycle	m	ıs	1280	See Table A.7.3.36.1-
				3
Layer 3 filtering			Enabled	Counters:
				N310 = 1; N311 = 1
T310 timer	m	ıs	0	T310 is disabled
T311 timer	m	ıs	1000	T311 is enabled
Periodic CQI reporting r	node		PUCCH 1-0	As defined in table
				7.2.2-1 in TS 36.213.
CQI reporting periodicity		ıs	1	Minimum CQI
				reporting periodicity
T1	S		32	
T2 T3	S	6	12.8 13	

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.36.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring test in DRX for UE category 0

Parameter	Unit		Test 2				
		T1	T2	T3			
E-UTRA RF Channel			1	l			
Number							
BW _{channel}	MHz		10				
Special subframe			6				
configuration Note 1							
I Uplink-downlink			1				
configuration Note 1							
PCFICH/PDCCH/PHICH			R.7 TDD				
parameters defined in							
section A.3.1.2.2							
OCNG Pattern defined in			OP.2 TDD	'			
A.3.2.2 (TDD)							
ρα, ρΒ			-3				
PCFICH_RB	dB		1				
PDCCH_RA	dB		4				
PDCCH_RB	dB		4				
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB		2				
PHICH_RA	dB		-3				
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note2}	dB						
OCNG_RB ^{Note2}	dB						
N_{oc}	dBm/15	-98					
SNR Note 7	kHz dB	F.G.	-5.6 -9.6 -13.6				
Propagation condition	иь	-5.0	AWGN				
Correlation Matrix and			2x1				
Antenna Configuration Note 1: For special sub	frame and i	Inlink down	alink confic	urations			
see Tables 4.2				urations			
Note 2: OCNG shall be				Cell # 1			
are fully allocat							
spectral density							
Note 3: The uplink reso							
the UE prior to							
Note 4: The timers and				rs are			
	configured prior to the start of time period T1.						
Note 5: The signal con			other than t	the			
device under te							
Note 6: SNR levels cor				o over			
the cell-specific				.			
Note 7: The SNR in tim							
SNR1, SNR2 a	ind SNR3 re	spectively	in figure A.	.7.3.36.1-			
1.							

Table A.7.3.36.1-3: DRX-Configuration for E-UTRAN TDD out-of-sync test for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.7.3.36.1-4: TimeAlignmentTimer - Configuration for E-UTRAN TDD out-of-sync testing for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS
TimeAlignmentTimer	iiiiiiity	36.331
		For further information see
sr-ConfigIndex	2	clause 6.3.2 in TS 36.331 and
		section10.1 in TS 36.213.

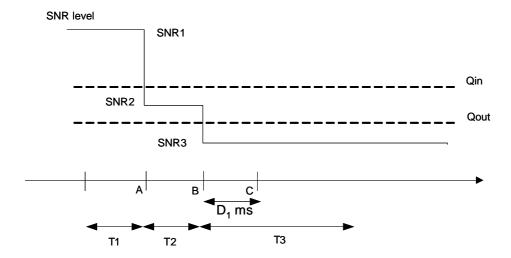


Figure A.7.3.36.1-1: SNR variation for out-of-sync testing in DRX

A.7.3.36.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration $D_1 = 6500$ ms after the start of time duration T3).

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

A.7.3.37 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category 0

A.7.3.37.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.11.

The test parameters are given in Tables A.7.3.37.1-1, A.7.3.37.1-2, A.7.3.37.1-3 and A.7.3.37.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.37.1-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.37.1-1: General test parameters for E-UTRAN TDD in-sync test in DRX for UE category 0

Pa	Parameter		Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel
				number 1
E-UTRA RF Ch	nannel Number		1	One E-UTRA TDD carrier
				frequency is used.
	E-UTRA Channel Bandwidth		10	
(BW _{channel})				
CP length	T		Normal	
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
In sync transmission	Number of Control OFDM symbols		2	In sync threshold Q _{in} and the corresponding hypothetical
parameters	Aggregation level	CCE	4	PDCCH/PCFICH transmission
(Note 1)	ρ _A , ρ _B		-3	parameters are as specified in
	Ratio of PDCCH to RS EPRE	dB	1	clause 7.11.1 and Table 7.11.1-2 respectively.
	Ratio of PCFICH to RS EPRE	dB	1	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync	Number of Control		2	Out of sync threshold Q _{out} and
transmission	OFDM symbols			the corresponding hypothetical
parameters	Aggregation level	CCE	8	PDCCH/PCFICH transmission
(Note 1)	ρ _A , ρ _B		-3	parameters are as specified in
	Ratio of PDCCH to RS EPRE	dB	4	clause 7.11.1 and Table 7.11.1-1 respectively.
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	40	See Table A.7.3.37.1-3
Layer 3 filtering)		Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI re	eporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		S	4	
T2		S	1.6	
T3		S	1.46	
T4		S	0.4	
T5		S	4	
Note 1: PDC	CH/PCFICH correspo	ndina to	the in-sync and	out of eyec transmission

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.37.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring test in DRX for UE category 0

Parameter	Unit	Test 1					
		T1	T2	T3	T4	T5	
E-UTRA RF Channel Number				1			
BW _{channel}	MHz			10			
Special subframe configuration Note 1		6					
Uplink-downlink configuration				1			
PCFICH/PDCCH/PHICH				R.7 TDD			
parameters defined in section A.3.1.2.2							
OCNG Pattern defined in							
A.3.2.2 (TDD)				OP.2 TDD			
ρ _Α , ρ _Β				-3			
PCFICH_RB	dB			1			
PDCCH_RA	dB	1					
PDCCH_RB	dB			1			
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB			-3			
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note2}	dB						
OCNG_RB ^{Note2}	dB						
N_{oc}	dBm/15			-98			
	kHz						
SNR Note 7	dB	-5.6	-9.6	-13.6	-9.6	-5.6	
Propagation condition				AWGN			
Correlation Matrix and Antenna Configuration		2x1					
Note 1: For special subframe Note 2: OCNG shall be used transmitted power so	such that the	resources in	cell # 1 are	fully allocated			

- transmitted power spectral density is achieved for all OFDM symbols.
- Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period
- Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and Note 7:
 - SNR5 respectively in figure A.7.3.37.1-1.

Table A.7.3.37.1-3: DRX-Configuration for E-UTRAN TDD out-of-sync test for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table A.7.3.37.1-4: TimeAlignmentTimer - Configuration for E-UTRAN TDD out-of-sync testing for UE category 0

Field	Field Value	
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

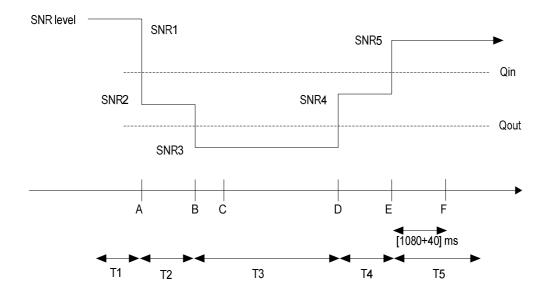


Figure A.7.3.37.1-1: SNR variation for in-sync testing in DRX

A.7.3.37.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.38 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

A.7.3.38.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.38.1-1, A.7.3.38.1-2, A.7.3.38.1-3, and A.7.3.38.1-4. There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure A.7.3.38.1-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.38.1-1: General test parameters for E-UTRAN FDD out-of-sync tests in DRX in synchronous dual connectivity

Pa	rameter	Unit	Value	Comment
Active cell			Cell 1	Cell 1 is PCell on E-UTRA RF channel number 1, and
			Cell 2	cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	Two E-UTRA FDD carrier frequencies are used.
	nnel Bandwidth	MHz	5, 10, 20	
(BWchannel)				
	atrix and Antenna		2x2 Low	Correlation Matrix and Antenna Configuration are
Configuration				defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control		5MHz: 3	Out of sync threshold Q _{out} and the corresponding
	OFDM symbols		10MHz: 2	hypothetical PDCCH/PCFICH transmission parameters
Out of sync		005	20MHz: 2	are as specified in clause 7.6.1 and Table 7.6.1-1
transmission	Aggregation level	CCE	8	respectively.
parameters	ρΑ, ρΒ		-3	
(Note 1)	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on	cell 1	ms	640	See Table A.7.3.38.1-3
DRX cycle on	cell 2	ms	40	See Table A.7.3.38.1-3
Timing offset	between cell 1 and	μS	33	For synchronous dual connectivity
cell 2				
Layer 3 filterin	ng		Enabled	Counters:
				N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
	reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting	periodicity	ms	2	Minimum CQI reporting periodicity
T1		S	4	
T2		S	1.6	
T3		S	1.8	
Nata di DD	0011/0051011	1 ¹		to a considering an account of the constant of

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.38.1-2: Cell specific test parameters for E-UTRAN FDD out-of-sync radio link monitoring in DRX in synchronous dual connectivity

Parameter	Unit		Cell 1			Cell 2			
		T1	T2	Т3	T1	T2	Т3		
E-UTRA RF Channel Number			1			2			
BW _{channel}	MHz		5, 10, 20			5, 10, 20			
Correlation Matrix and Antenna Configuration			2x2 Low			2x2 Low			
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		10	5MHz: R.12 FDD 5MHz: R.12 FDD 10MHz: R.7 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD 20MHz: R.13 FDD			DD DD			
OCNG Pattern		101	Hz: OP.16 F MHz: OP.2 F Hz: OP.12	:DD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
ρΑ, ρΒ			-3			-3			
PCFICH_RB	dB		1		1				
PDCCH_RA	dB		1		1				
PDCCH_RB	dB		1		1				
PBCH_RA	dB								
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PHICH_RA	dB		-3		-3				
PHICH_RB	dB		-3		-3				
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA ^{Note1}	dB								
OCNG_RB ^{Note1}	dB								
SNR Note 6 (5MHz bandwidth)	dB	-2.3	-2.3	-2.3	-2.3	-5.7	-12.2		
SNR Note 6 (10MHz bandwidth)	dB	-2.3	-2.3	-2.3	-2.3	-6.2	-12.2		
SNR Note 6 (20MHz bandwidth)	dB	-2.9	-2.9	-2.9	-2.9	-6.8	-12.8		
N_{oc}	dBm/15 kHz	-98				-98			
Propagation condition		ETU 70 Hz			ETU 70 Hz				
Time offset to cell1	μS		-		33				

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Table A.7.3.38.1-3: DRX-Configuration for E-UTRAN FDD out-of-sync tests in synchronous dual connectivity

Field	Va	lue	Comment
rieiu	Cell 1	Cell 2	Comment
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.

Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.

Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.

Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.

Note 6: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.38.1-1.

Table A.7.3.38.1-4: TimeAlignmentTimer -Configuration for E-UTRAN FDD out-of-sync testing in synchronous dual connectivity

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

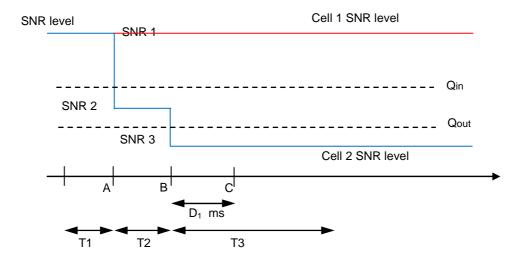


Figure A.7.3.38.1-1 SNR variation for out-of-sync testing in DRX

A.7.3.38.2 Test Requirements

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

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

A.7.3.39 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

A.7.3.39.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in asynchronous dual connectivity. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in section 7.6.

The test parameters are given in Tables A.7.3.39.1-1, A.7.3.39.1-2, A.7.3.39.1-3 and A.7.3.39.1-4. There are two cells in the test. Cell 1 is PCell in MCG and cell 2 is PSCell in SCG. Before the test starts the UE is connected to cell 1 on radio channel 1 and to cell 2 on radio channel 2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. The downlink SNR in cell 1 keeps constant in the test. Figure A.7.3.39.1-1 shows the variation of the downlink SNR in the cell 2 to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2 in asynchronous dual connectivity. For both cells, the UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH

and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.39.1-1: General test parameters for E-UTRAN FDD out-of-sync in DRX

Р	Parameter		Value	Comment
Active cells			Cell 1 and cell 2	Cell 1 (PCell) is on E-UTRA RF channel number 1 and cell 2 (PSCell) is on E-UTRA RF channel number 2
CP length			Normal	
Correlation Matr Configuration	ix and Antenna		2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
Out of sync transmission parameters	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission
(Note 1)	Aggregation level	CCE	8	parameters are as specified in
	ρ _A , ρ _B		-3	section 7.6.1 and Table 7.6.1-1
	Ratio of PDCCH to RS EPRE	dB	1	respectively.
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle in cel	l1	ms	640	See Table A.7.3.39.1-3
DRX cycle in cel	12	ms	40	See Table A.7.3.39.1-3
Layer 3 filtering	•		Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1;
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer	T313 timer		0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting pe	eriodicity	ms	2	Minimum CQI reporting periodicity
T1		S	4	
T2		S	1.6	
T3		S	1.8	

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Note 3: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section A.3.6.11.

Note 2: The test parameters in the table apply to both cell 1 and cell 2 unless specified otherwise.

Table A.7.3.39.1-2: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring in DRX

Para	meter	Unit	Cell 1 (PCell)			Cell 2 (PSCell)			
			T1	T2	T3	T1	T2	T3	
E-UTRA R	F Channel			1			2		
Number									
E-UTRA C		MHz		5, 10, 20		5, 10, 20			
	(BW _{channel})			5.40.5				-0.0	
PCFICH/PI				Hz: R.12 F		5MHz: R.12 FDD			
CH parame None of the			-	MHz: R.7 F		_	MHz: R.7 F		
are intende			201\	//Hz: R.13	רטט	2010	//Hz: R.13	FDD	
UE under t									
Correlation				2x2 Low			2x2 Low		
and Antenr				ZXZ LUW			ZXZ LUW		
Configurati									
OCNG Pat			5MHz: OP.16 FDD						
defined in			10MHz: OP.2 FDD 5MHz: OP.16 FDD					FDD	
(FDD)			20MHz: OP.12 FDD 10MHz: OP.2 FDD						
				_			Hz: OP.12		
ρ _Α , ρ _Β				-3			-3		
PCFICH_R	RB	dB		1			1		
PDCCH_R		dB	1 1						
PDCCH_R		dB	1 1						
PBCH_RA		dB							
PBCH_RB		dB							
PSS_RA		dB							
SSS_RA		dB		0			0		
PHICH_RA		dB		-3			-3		
PHICH_RE		dB							
PDSCH_R		dB							
PDSCH_R	B Note1	dB							
OCNG_RA	Note1	dB							
OCNG_RB		dB							
SNR Note 6	5MHz	dB	-2.3	-2.3	-2.3	-2.3	-5.7	-12.2	
	BW _{channel}	<u>r</u>	0.0	0.0	0.0	0.0	0.0	40.0	
	10MHz	dB	-2.3	-2.3	-2.3	-2.3	-6.2	-12.2	
	BW _{channel}	dB				2.0	6.0	10.0	
	BW _{channel}	aв	-2.9	-2.9	-2.9	-2.9	-6.8	-12.8	
N	- * * Channel	dBm/15	-98 -98						
N_{oc}		kHz							
Propagatio	n condition			ETU 70 Hz	7		ETU 70 Hz	<u></u>	
Receive tin	ne offset to	μs		-			500		

- Note 1: OCNG shall be used such that the resources in Cell 1 and Cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.39.1-1.
- Note 7: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table A.7.3.39.1-3: DRX-Configuration for E-UTRAN FDD out-of-sync tests

Field	Va	lue	Comment
Field	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in
drx-InactivityTimer	psf1	psf1	section 6.3.2 in
drx-RetransmissionTimer	psf1	psf1	3GPP TS 36.331
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable	

Table A.7.3.39.1-4: TimeAlignmentTimer - Configuration for E-UTRAN FDD out-of-sync testing

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

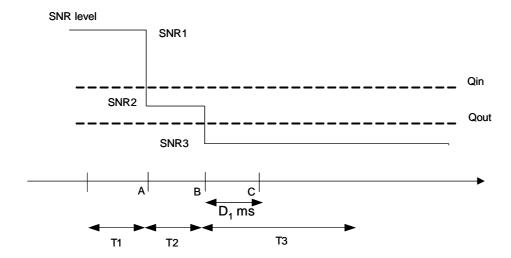


Figure A.7.3.39.1-1 SNR variation for out-of-sync test in DRX

A.7.3.39.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In the test, during time durations T1, T2 and T3, the UE shall transmit uplink signal on cell 1 at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

In the test, during the period from time point A to time point B the UE shall transmit uplink signal on cell 2 at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

In the test, the UE shall stop transmitting uplink signal on cell 2 no later than time point C (duration $D_1 = 900$ ms after the start of time duration T3).

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

A.7.3.40 E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

A.7.3.40.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.40.1-1, A.7.3.40.1-2, A.7.3.40.1-3, and A.7.3.40.1-4. There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure A.7.3.40.1-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.40.1-1: General test parameters for E-UTRAN TDD out-of-sync tests in DRX in synchronous dual connectivity

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is PCell on E-UTRA RF channel number 1, and
			Cell 2	cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
E-UTRA RF C	Channel Number		1, 2	Two E-UTRA TDD carrier frequencies are used.
E-UTRA Char (BWchannel)	E-UTRA Channel Bandwidth (BWchannel)		5, 10, 20	
Correlation MacConfiguration	Correlation Matrix and Antenna Configuration		2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
DCI format			1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause 7.6.1 and Table 7.6.1-1
transmission	Aggregation level	CCE	8	respectively.
parameters	ρΑ, ρΒ		-3	
(Note 1)	Ratio of PDCCH to RS EPRE	dB	1	
Ratio of PCFICH to RS EPRE		dB	1	
DRX cycle on	cell 1	ms	640	See Table A.7.3.40.1-3
DRX cycle on	cell 2	ms	40	See Table A.7.3.40.1-3
Timing offset cell 2	between cell 1 and	μS	33	For synchronous dual connectivity
Layer 3 filterin	ng		Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer	T313 timer		0	T313 is disabled
Periodic CQI	reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting	periodicity	ms	1	Minimum CQI reporting periodicity
T1		S	4	
T2		S	1.6	
T3		S	1.8	

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.40.1-2: Cell specific test parameters for E-UTRAN TDD out-of-sync radio link monitoring in DRX in synchronous dual connectivity

Parameter	Unit		Cell 1			Cell 2		
		T1	T2	Т3	T1	T2	T3	
E-UTRA RF Channel Number			1			2		
BW _{channel}	MHz		5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration			2x2 Low			2x2 Low		
Special subframe configuration Note1			6			6		
Uplink-downlink configuration Note2			1			1		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		10	MHz: R.12 TI MHz: R.7 TI MHz: R.13 T	OD	10	MHz: R.12 T DMHz: R.7 T MHz: R.13 T	DD	
OCNG Pattern		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			
ρΑ, ρΒ		-3			-3			
PCFICH_RB	dB		1		1			
PDCCH_RA	dB		1		1			
PDCCH_RB	dB		1		1			
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PHICH_RA	dB		-3			-3		
PHICH_RB	dB		-3		-3			
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note3}	dB							
OCNG_RB ^{Note3}	dB							
SNR Note 8 (5MHz bandwidth)	dB	-1.6	-1.6	-1.6	-1.6	-5.2	-11.9	
SNR Note 8 (10MHz bandwidth)	dB	-2.3	-2.3	-2.3	-2.3	-5.9	-11.9	
SNR Note 8 (20MHz bandwidth)	dB	-3.0	-3.0	-3.0	-3.0	-6.6	-12.6	
N_{oc}	dBm/15 kHz					•		
Propagation condition			ETU 70 Hz			ETU 70 Hz		
Time offset to cell1	μS		-			33		

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.40.1-1.

Table A.7.3.40.1-3: DRX-Configuration for E-UTRAN TDD out-of-sync tests in synchronous dual connectivity

Field	Va	lue	Comment
rieid	Cell 1	Cell 2	Comment
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table A.7.3.26.1-4: TimeAlignmentTimer -Configuration for E-UTRAN FDD out-of-sync testing in synchronous dual connectivity

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

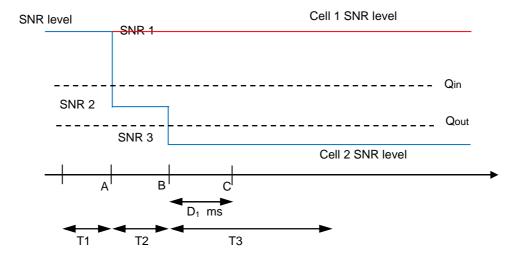


Figure A.7.3.40.1-1 SNR variation for out-of-sync testing in DRX

A.7.3.40.2 Test Requirements

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

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

A.7.3.41 E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

A.7.3.41.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in dual connectivity. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.41.1-1, A.7.3.41.1-2, A.7.3.41.1-3 and A.7.3.41.1-4. There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.41.1-1 shows the variation of the downlink SNR in the PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration for PCell and PSCell is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test

Table A.7.3.41.1-1: General test parameters for E-UTRAN FDD-FDD Radio Link Monitoring Test for Insync in DRX in synchronous dual connectivity

I	Parameter	Unit	Value	Comment		
E-UTRA RF C	hannel Number		1, 2	Two E-UTRA FDD carrier frequency are used.		
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2		
CP length			Normal			
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212		
In sync transmission	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW		
parameters (Note 1)	Number of Control OFDM symbols		3	For 5MHz channel BW		
	Aggregation level	CCE	4	In sync threshold Q _{in} and the corresponding hypothetical		
	ρΑ, ρΒ		0	PDCCH/PCFICH transmission parameters		
	Ratio of PDCCH to RS EPRE		0	are as specified in clause 7.6.1 and Table 7.6.1-2 respectively.		
	Ratio of PCFICH to RS EPRE		4			
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212		
Out of sync transmission	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW		
parameters (Note 1)	Number of Control OFDM symbols		3	For 5MHz channel BW		
	Aggregation level	CCE	8	Out of sync threshold Q _{out} and the corresponding hypothetical		
	ρΑ, ρΒ		0	PDCCH/PCFICH transmission parameters		
	Ratio of PDCCH to RS EPRE	dB	4	are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.		
	Ratio of PCFICH to RS EPRE	dB	4			
DRX cycle on		ms	640	See Table A.7.3.41.1-3		
DRX cycle on		ms	40	See Table A.7.3.41.1-3		
Layer 3 filterin	g		Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1		
T310 timer		ms	2000	T310 is enabled		
T311 timer		ms	1000	T311 is enabled		
T313 timer		ms	2000	T313 is enabled		
Periodic CQI r			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.		
CQI reporting	periodicity	ms	2	Minimum CQI reporting periodicity		
T1		S	4			
T2		S	1.6			
T3		S	1.46			
T4		S	0.4			
T5 Note 1: PD0		S	4	sync transmission parameters need not be		

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section A.3.11.

Note 7:

Table A.7.3.41.1-2: Cell specific test parameters for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

E-UTRA RF Cha BW _{channel}	nnel Number	Unit MHz	T1 ~ T5	T1	T2	T3	T4	T5	
BW _{channel}	nnel Number	MHz	1						
		MHz				2			
			5: $N_{RB,c} = 25$			$: N_{RB,c} = 2$			
			10: $N_{RB,c} = 50$			$): N_{RB,c} = 3$			
			20: N _{RB,c} = 100			$: N_{RB,c} = 1$			
PCFICH/PDCCH	/PHICH		5MHz: R.11 FDD		5MI	Hz: R.11 F	FDD		
parameters defin	ed in A.3.1.2.1		10MHz: R.6 FDD		10N	//Hz: R.6 F	FDD		
			20MHz: R.10 FDD			Hz: R.10			
OCNG Pattern de	efined in A.3.2.1		5MHz: OP.16 FDD	FDD 5MHz: OP.16 FDD					
(FDD)			10MHz: OP.2 FDD		-	Hz: OP.2			
			20MHz: OP.12 FDD		20M	Hz: OP.12	FDD		
ρ_A , ρ_B				0 0					
PCFICH_RB		dB	4			4			
PDCCH_RA		dB	0			0			
PDCCH_RB		dB	0			0			
PBCH_RA		dB							
PBCH_RB		dB							
PSS_RA		dB							
SSS_RA		dB		0					
PHICH_RA		dB dB	- 0						
PHICH_RB									
PDSCH_RA		dB							
PDSCH_RB		dB							
OCNG_RA ^{Note1}		dB							
OCNG_RB ^{Note1}		dB					1		
Note 6	5MHz BW _{channel}		-2.3	-2.3	-5.7	-12.2	-7.3	-2.3	
SNR Note 6	10MHz	dB	-4.7	-4.7	-9.5	-13.5	-8.7	-4.7	
	BW _{channel}								
	20MHz		-4.7	-4.7	-9.5	-13.5	-8.7	-4.7	
	BW _{channel}								
N_{oc}		dBm/15 kHz			-98				
Propagation cond	dition		AWGN			AWGN			
Correlation Matrix	x and Antenna		1x2			1x2			
Receive time offs	set to cell1 Note 7	μS	- 33						
Note 1: OCNG	shall be used suc	h that the reso	te resources in cell 1 and cell 2 are fully allocated and a constant total						
transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.									
Note 5: SNR le Note 6: The S	evels correspond to	o the signal to periods T1, T	noise ratio over the cell- 2, T3, T4 and T5 is deno	specific r	eference	signal RE		and	

Table A.7.3.41.1-3: DRX-Configuration for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

antenna connector including time alignment error between the two cells.

Receive time difference between subframe boundaries of signals received from the two cells at the UE

Field	Va	lue	Comment
Field	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in
drx-InactivityTimer	psf1	psf1	section 6.3.2 in
drx-RetransmissionTimer	psf1	psf1	3GPP TS 36.331
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable	

Table A.7.3.41.1-4: TimeAlignmentTimer -Configuration for E-UTRAN FDD-FDD Radio Link Monitoring
Test for In-sync in DRX in synchronous dual connectivity

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

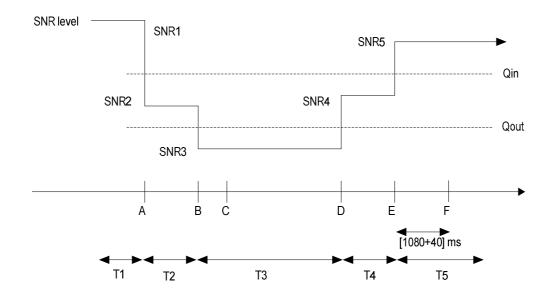


Figure A.7.3.41.1-1 SNR variation of cell 2 (PSCell) for in-sync testing in DRX

A.7.3.41.2 Test Requirements

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

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

A.7.3.42 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC

A.7.3.42.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in asynchronous dual connectivity. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.42.1-1, A.7.3.42.1-2, A.7.3.42.1-3 and A.7.3.42.1-4. There are two cells in the test. Cell 1 is PCell in MCG and cell 2 is PSCell in SCG. Before the test starts the UE is connected to cell 1 on radio channel 1 and to cell 2 on radio channel 2. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. The downlink SNR in cell 1 keeps constant in the test. Figure A.7.3.42.1-1 shows the variation of the downlink SNR in cell 2 to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2 in asynchronous dual connectivity. For both cell 1 and cell 2, the UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.42.1-1: General test parameters for E-UTRAN FDD in-sync test in DRX

F	Parameter	Unit	Value	Comment
Active cells			Cell 1 and cell 2	Cell 1 (PCell) is on E-UTRA RF channel number 1 and cell 2 (PSCell) is on E-UTRA RF channel number 2
CP length			Normal	
Antenna Conf			1x2	
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
In sync transmissio n	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	In sync threshold Q _{in} and the corresponding hypothetical PDCCH/PCFICH transmission
parameters	Aggregation level	CCE	4	parameters are as specified in
(Note 1)	ρ _A , ρ _B		0	clause and Table 7.6.1-2
	Ratio of PDCCH to RS EPRE		0	respectively.
	Ratio of PCFICH to RS EPRE		4	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync transmissio	Number of Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding hypothetical
n	Aggregation level	CCE	8	PDCCH/PCFICH transmission
parameters	ρ _A , ρ _B		0	parameters are as specified in
(Note 1)	Ratio of PDCCH to RS EPRE	dB	4	clause 7.6.1 and Table 7.6.1-1 respectively.
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle in		ms	640	See Table A.7.3.42.1-3
DRX cycle in		ms	40	See Table A.7.3.42.1-3
Layer 3 filtering	ng		Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI	Periodic CQI reporting mode		PUCCH 1- 0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		S	4	
T2		S	1.6	
T3		S	1.46	
T4		S	0.4	
T5		S	4	

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Note 2: The parameters in the table apply to both cell 1 and cell 2 unless defined otherwise.

Note 3: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section A.3.6.11.

Table A.7.3.42.1-2: Cell specific test parameters for E-UTRAN FDD for in-sync radio link monitoring in DRX

0	arameter	Unit	Cell 1 (PCell)		С	ell 2 (PSC	ell)	
ŗ	arameter	Onit	T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF	Channel Number		1			2		
E-UTRA Cha (BW _{channel})	innel Bandwidth	MHz	5, 10, 20	5, 10, 20				
PCFICH/PDC	CCH/PHICH		5MHz: R.11		5M	1Hz: R.11 I	FDD	
parameters.			FDD			MHz: R.6 I		
None of the I	PDCCH are intended		10MHz: R.6		201	ИHz: R.10	FDD	
for the UE un	nder test.		FDD					
			20MHz: R.10					
			FDD					
OCNG Patte	rn		5MHz: OP.16					
			FDD		5MI	Hz: OP.16	FDD	
			10MHz: OP.2			/Hz: OP.2		
			FDD		20M	IHz: OP.12	FDD	
			20MHz: OP.12 FDD					
2: 2-			0	0				
ρ _A , ρ _B PCFICH_RB		dB	4			4		
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0			0		
PBCH_RA		dB	· ·					
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB	0			0		
PHICH_RB		dB				U		
PDSCH_RA		dB						
PDSCH_RB	10.1	dB						
OCNG_RA ^{NO}	nie i	dB						
OCNG_RB ^{NO}		dB				1	1	
SNR Note 6	5MHz BW _{channel}	dB	-2.3	-2.3	-5.7	-12.2	-7.3	-2.3
	10MHz BW _{channel}	dB	-4.7	-4.7	-9.5	-13.5	-8.7	-4.7
	20MHz BW _{channel}	dB	-4.7	-4.7	-9.5	-13.5	-8.7	-4.7
N_{oc}	,	dBm/15 kHz	-98					
Propagation	condition		AWGN					
Receive time	offset to cell1 Note 7	μs	- 500					
tra	Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							otal

Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.

Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.

Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.

Note 6: The SNR of cell 2 in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.6.1-1.

Note 7: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells..

Table A.7.3.42.1-3: DRX-Configuration for E-UTRAN FDD out-of-sync tests

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in
drx-InactivityTimer	psf1	psf1	TS 36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable]

Table A.7.3.42.1-4: TimeAlignmentTimer - Configuration for E-UTRAN FDD out-of-sync testing

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

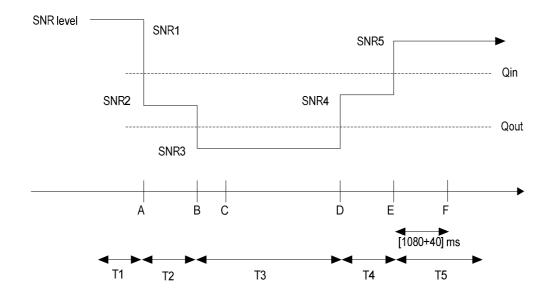


Figure A.7.3.42.1-1 Cell 2 SNR variation for in-sync testing in DRX

A.7.3.42.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal on cell 2 at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

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

A.7.3.43 E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

A.7.3.43.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in dual connectivity. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

The test parameters are given in Tables A.7.3.43.1-1, A.7.3.43.1-2, A.7.3.43.1-3 and A.7.3.43.1-4. There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.43.1-1 shows the variation of the downlink SNR in the PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration for PCell and PSCell is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.43.1-1: General test parameters for E-UTRAN TDD-TDD Radio Link Monitoring Test for Insync in DRX in synchronous dual connectivity

I	Parameter	Unit	Value	Comment
E-UTRA RF C	hannel Number		1, 2	Two E-UTRA TDD carrier frequency are used.
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
In sync transmission	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
parameters (Note 1)	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	4	In sync threshold Q _{in} and the corresponding hypothetical
	ρΑ, ρΒ		0	PDCCH/PCFICH transmission parameters
	Ratio of PDCCH to RS EPRE		0	are as specified in clause 7.6.1 and Table 7.6.1-2 respectively.
	Ratio of PCFICH to RS EPRE		4	
	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
Out of sync transmission	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
parameters (Note 1)	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	8	Out of sync threshold Q _{out} and the corresponding hypothetical
	ρΑ, ρΒ		0	PDCCH/PCFICH transmission parameters
	Ratio of PDCCH to RS EPRE	dB	4	are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle on		ms	640	See Table A.7.3.43.1-3
DRX cycle on		ms	40	See Table A.7.3.43.1-3
Layer 3 filterin	g		Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI r			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting	periodicity	ms	1	Minimum CQI reporting periodicity
T1		S	4	
T2		S	1.6	
T3		S	1.46	
T4		S	0.4	
T5 Note 1: PD0		S	4	sync transmission parameters need not be

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section A.3.11.

Table A.7.3.43.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Do		l lmit	Cell 1(PCell)		Ce	II 2 (PSC	ell)	
Pa	rameter	Unit	T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF C	hannel Number		1			2		
BW _{channel}	BW _{channel}		5: N _{RB,c} = 25		5: N _{RB,c} = 25			
			10: $N_{RB,c} = 50$		10	$O: N_{RB,c} = $	50	
			20: N _{RB,c} = 100		20	: N _{RB,c} = 1	00	
Special subfra	me		6			6		
configuration	ote i							
	nk configuration Note2		1			1		
PCFICH/PDC			5MHz: R.11 TDD			Hz: R.11 ⁻		
parameters de	fined in A.3.1.2.1		10MHz: R.6 TDD			//Hz: R.6		
			20MHz: R.10 TDD		20M	Hz: R.10	TDD	
	defined in A.3.2.1		5MHz: OP.10 TDD		5ME	lz: OP.10	TDD	
(FDD)			10MHz: OP.2 TDD		-	Hz: OP.2		
			20MHz: OP.8 TDD			Hz: OP.8		
ρ _A , ρ _B		-ID	0			0		
PCFICH_RB		dB	4			4		
PDCCH_RA		dB	0			0		
PDCCH_RB		dB	0			0		
PBCH_RA		dB						
PBCH_RB		dB						
PSS_RA		dB	4					
SSS_RA		dB						
PHICH_RA		dB	0			0		
PHICH_RB		dB		•				
PDSCH_RA		dB						
PDSCH_RB	1	dB						
OCNG_RA ^{Note}	1	dB						
OCNG_RB ^{Note}		dB				10.4	0.4	
SNR Note 6	5MHz BW _{channel}	ID.	-5.1	-5.1	-9.1	-13.1	-9.1	-5.1
SNR	10MHz	dB	-5.1	-5.1	-9.1	-13.1	-9.1	-5.1
	BW _{channel}							
	20MHz		-5.1	-5.1	-9.1	-13.1	-9.1	-5.1
	BW _{channel}							
N_{oc}		dBm/15 kHz	-98					
Propagation co	ondition		AWGN			AWGN		
Correlation Ma	atrix and Antenna		1x2 1x2					
Configuration								
Receive time of	offset to cell1 Note 9	μS	-			33		
				·				

- Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.43.1-1.
- Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table A.7.3.43.1-3: DRX-Configuration for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Field	Va	lue	Comment
Field	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in
drx-InactivityTimer	psf1	psf1	section 6.3.2 in
drx-RetransmissionTimer	psf1	psf1	3GPP TS 36.331
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable	

Table A.7.3.43.1-4: TimeAlignmentTimer -Configuration for E-UTRAN TDD-TDD Radio Link Monitoring
Test for In-sync in DRX in synchronous dual connectivity

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

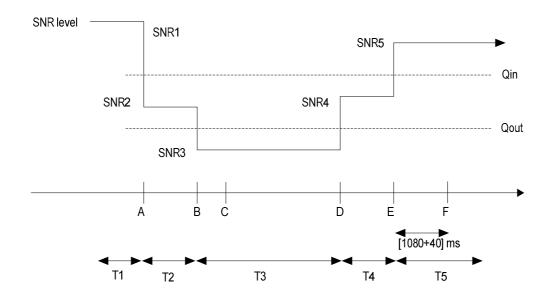


Figure A.7.3.43.1-1 SNR variation of cell 2 (PSCell) for in-sync testing in DRX

A.7.3.43.2 Test Requirements

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

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

A.7.4 Interruption for Dual Connectivity

A.7.4.1 E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC

A.7.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that when PCell is in non-DRX and PSCell is in DRX, PCell interruptions due to transitions from active to non-active and from non-active to active during PSCell DRX the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for FDD PCell in dual connectivity requirements in clause 7.12.2.

The test parameters are given in Table A.7.4.1.1-1, A.7.4.1.1-2 and A.7.4.1.1-3 below. In the test there are two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. PCell is continuously scheduled in DL while PSCell is not scheduled and has DRX configured. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Cell1 shall be configured as PCell and Cell2 shall be configured as PSCell. Prior to start of T1 the DRX inactivity timer for the PSCell have already expired. During T1 the UE shall be continuously scheduled on PCell while not scheduled on PSCell.

Table A.7.4.1.1-1: General test parameters for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test.
Active PCell		Cell1	PCell on RF channel number 1.
Configured PSCell		Cell2	PSCell on RF channel number 2.
CP length		Normal	
DRX		ON	DRX related parameters are defined in Table A.8.23.4.1-3
Measurement gap pattern Id		OFF	
T1	s	10	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 2: A UE capable of both synchronous and asynchronous DC operations is only required to pass this test case in accordance with the principle defined in section A.3.11.

Table A.7.4.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Parameter	Unit	Cell1	Cell2	
		T1	T1	
E-UTRA RF Channel		1	2	
Number		•		
BW _{channel}	MHz	5MHz: N _{RB,c} = 25	5MHz: N _{RB,c} = 25	
		10MHz: $N_{RB,c} = 50$	10MHz: N _{RB,c} = 50	
PDSCH parameters:		20MHz: $N_{RB,c} = 100$ 5MHz: R.TBD FDD	20MHz: N _{RB,c} = 100 5MHz: R.5 FDD	
DL Reference		10MHz: R.3 FDD	10MHz: R.0 FDD	
Measurement Channel		20MHz: R.6 FDD	20MHz: R.4 FDD	
PCFICH/PDCCH/PHICH		CMUL. D 44 EDD	CMULE, D.44 EDD	
parameters:		5MHz: R.11 FDD 10MHz: R.6 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD	
DL Reference		20MHz: R.10 FDD	20MHz: R.10 FDD	
Measurement Channel				
OCNG Patterns		5MHz: OP.16 FDD	5MHz: OP.15 FDD	
		10MHz: OP.2 FDD	10MHz: OP.1 FDD	
PBCH_RA	dB	20MHz: OP.12 FDD	20MHz: OP.11 FDD	
PBCH_RB	dВ			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH RA	dB			
PHICH_PB	dB	0	0	
PDCCH_RA	dB			
PDCCH_PB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
$N_{oc}^{ m Note 2}$	dBm/15 KHz	-101	-101	
\hat{E}_s/N_{oc}	dB	19	19	
\hat{E}_{s}/I_{ot}	dB	19	19	
RSRP Note 3	dBm/15 KHz	-82	-82	
SCH_RP Note 3	dBm/15	-82	-82	
lo Note 3	KHz dBm/Ch	5/16	5/16	
10	BW	-54.16 +10log	-54.16 +10log	
		(N _{RB,c} /50)	(N _{RB,c} /50)	
Propagation Condition		AWGN	AWGN	
Correlation Matrix and				
Antenna Configuration	<u> </u>	1x2 Low	1x2 Low	
Time offset to cell1 Note 4	μs	-	33	

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

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.7.4.1.1-3: DRX-Configuration for E-UTRAN FDD-FDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Field	Cell1	Cell2	Comment
rieiu	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer ^{Note 1}	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	Sf160	
shortDRX	disable	disable	
Note 1: UE is continuously schedule	ed in PCell		

A.7.4.1.2 Test Requirements

The UE shall shall be continuously scheduled in PCell during the entire length of T1. UE shall not be scheduled in PSCell during T1. During the time duration T1 the UE shall transmit at leat 99% of ACK/NACK on PCell.

The UE shall not miss transmitting two consequtive ACK/NACK.

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

A.7.4.2 E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC

A.7.4.2.1 Test Purpose and Environment

The purpose of this test is to verify that when PCell is in non-DRX and PSCell is in DRX, PCell interruptions due to transitions from active to non-active and from non-active to active during PSCell DRX the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for TDD PCell in dual connectivity requirements in clause 7.12.2.

The test parameters are given in Table A.7.4.2.1-1, A.7.4.2.1-2 and A.7.4.2.1-3 below. In the test there are two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. PCell is continuously scheduled in DL while PSCell is not scheduled and has DRX configured. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Cell1 shall be configured as PCell and Cell2 shall be configured as PSCell. Prior to start of T1 the DRX inactivity timer for the PSCell have already expired. During T1 the UE shall be continuously scheduled on PCell while not scheduled on PSCell.

Table A.7.4.2.1-1: General test parameters for E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Parameter	Unit	Value	Comment
E-UTRA RF Channel		1, 2	Two radio channels are used for this test.
Number		1, 2	
Active PCell		Cell1	PCell on RF channel number 1.
Configured PSCell		Cell2	PSCell on RF channel number 2.
Special subframe		6	As specified in table 4.2-1 in TS 36.211.
configuration			Applicable to cell 1
Uplink-downlink		1	As specified in table 4.2-1 in TS 36.211.
configuration			Applicable to Cell1
CP length		Normal	As specified in table 4.2-2 in TS 36.211.
			Applicable to Cell1
DRX		ON	DRX related parameters are defined in
		ON	Table A.8.23.4.1-3
Measurement gap pattern		OFF	
ld		OFF	
T1	S	10	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 2: A UE capable of both synchronous and asynchronous DC operations is only required to pass this test case in accordance with the principle defined in section A.3.11.

Table A.7.4.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Parameter	Unit	Cell1	Cell2
		T1	T1
E-UTRA RF Channel Number		1	2
BW _{channel}	MHz	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$
		$20MHz: N_{RB,c} = 100$	$20MHz: N_{RB,c} = 100$
PDSCH parameters:		5MHz: R.4 TDD	5MHz: R.TBD TDD
DL Reference		10MHz: R.0 TDD	10MHz: R.TBD TDD
Measurement Channel		20MHz: R.4 FDD	20MHz: R.TBD TDD
PCFICH/PDCCH/PHICH		5MHz: R.11 TDD	5MHz: R.11 TDD
parameters:		10MHz: R.6 TDD	10MHz: R.6 TDD
DL Reference		20MHz: R.10 TDD	20MHz: R.10 TDD
Measurement Channel			
OCNG Patterns		5MHz: OP.10 TDD	5MHz: OP.9 TDD
		10MHz: OP.2 TDD	10MHz: OP.1 TDD
		20MHz: OP.8 TDD	20MHz: OP.7 TDD
DDOLL DA	in.		
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_PB	dB	0	0
PDCCH_RA	dB		
PDCCH_PB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
	dBm/15		
$N_{oc}^{ m Note~2}$	KHz	-101	-101
\hat{E}_s/N_{oc}	dB	19	19
\hat{E}_{s}/I_{ot}	dB	19	19
RSRP Note 2	dBm/15 KHz	-82	-82
SCH_RP Note 2	dBm/15 KHz	-82	-82
lo Note 3	dBm/Ch	-54.16	-54.16
	BW	+10log	+10log
		(N _{RB,c} /50)	(N _{RB,c} /50)
Propagation Condition		AWGN	AWGN
Correlation Matrix and			-
Antenna Configuration		1x2 Low	1x2 Low
Time offset to cell1 Note 3	μs	-	33
Note 1: OCNG shall be u		at both cells are fully alloc	eated and a constant

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

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

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

Table A.7.4.2.1-3: DRX-Configuration for E-UTRAN TDD-TDD DC interruption at transitions between active and non-active during DRX in synchronous DC

Field	Cell1	Cell2	Comment
rieiu	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer ^{Note 1}	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	Sf160	
shortDRX	disable	disable	
Note 1: UE is continuously schedule	ed in PCell		

A.7.4.2.2 Test Requirements

The UE shall shall be continuously scheduled in PCell during the entire length of T1. UE shall not be scheduled in PSCell during T1. During the time duration T1 the UE shall transmit at leat 99% of ACK/NACK on PCell.

The UE shall not miss transmitting two consequtive ACK/NACK.

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

A.7.4.3 E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

A.7.4.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE fulfils the requirement on interruptions on PCell at transitions between active and non-active during DRX in TS36.133 section 7.12.2.

The test parameters are given in Table A.7.4.3.1-1, Table A.7.4.3.1-2 and Table A.7.4.3.1-3 below. In the test there are two cells: Cell 1 and Cell 2. Cell 1 is PCell on the FDD primary component (RF channel 1). Cell 2 is PSCell on the FDD secondary component (RF channel 2). The test consists of 1 time period, with time duration of T1. PDCCH indicating a new transmission on PCell shall be sent continuously during the whole time duration to ensure UE would not enter DRX state on PCell. PSCell is in DRX state with 320ms DRX cycle.

Table A.7.4.3.1-1: General test parameters for E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

Parameter	Unit	Value	Comment
E-UTRA RF Channel		1, 2	Two radio channels are used for this test
Number		1, 2	
Active Cell			Cell 1 is PCell on E-UTRA RF channel
		Cell 1, Cell 2	number 1, and cell 2 is PSCell on E-UTRA
			RF channel number 2
CP length		Normal	
DRX on Cell1		OFF	
DRX on Cell2	ms	320	
Filter coefficient		0	L3 filtering is not used
T1	S	5	
Note 1: Even a UE capable of both synchronous and asynchronous DC operations is required to pass			

this test case in accordance with the principle defined in section A.3.11.

Table A.7.4.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

Parameter	Unit	Cell 1	Cell 2
		T1	T1
E-UTRA RF Channel		1	2
Number			
BW _{channel}	MHz	5: $N_{RB,c} = 25$	5: $N_{RB,c} = 25$
		10: $N_{RB,c} = 50$	10: $N_{RB,c} = 50$
		20: N _{RB,c} = 100	20: N _{RB,c} = 100
Correlation Matrix and		1x2 Low	1x2 Low
Antenna Configuration			
PDSCH parameters		5MHz: R.7 FDD	-
		10MHz: R.3 FDD	
POEIOLI/PPOOLI/PLIIO		20MHz: R.6 FDD	EMILE: D.44 EDD
PCFICH/PDCCH/PHIC		5MHz: R.11 FDD	5MHz: R.11 FDD
H parameters		10MHz: R.6 FDD	10MHz: R.6 FDD
OCNG Patterns		20MHz: R.10 FDD 5MHz: OP.20 FDD	20MHz: R.10 FDD 5MHz: OP.16 FDD
defined in A.3.2.1.1		10MHz: OP.20 FDD	10MHz: OP.16 FDD
(OP.1 FDD)		20MHz: OP.17 FDD	20MHz: OP.12 FDD
PBCH_RA	dB	20101112. 01 .17 1 00	20101112. 01 .12 1 00
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	0	0
PHICH_PB	dB		
PDCCH_RA	dB		
PDCCH_PB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
$N_{oc}^{ m Note~3}$	dBm/15 KHz	-101	-101
\hat{E}_s/N_{oc}	dB	19	19
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	19	19
RSRP Note 4	dBm/15 KHz	-82	-82
SCH_RP Note 4	dBm/15 KHz	-82	-82
lo Note 3	dBm/Ch BW	-54.16+10log	-54.16+10log
		(N _{RB,c} /50)	(N _{RB,c} /50)
Propagation Condition		AWGN	AWGN
Antenna Configuration		1x2	1x2
Receive timing offset to Cell1 Note 5	μs	-	500

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

Note 2: The resources for uplink transmission on PCell are assigned to the UE prior to the start of time period T1 to the end of T2. The resources for uplink transmission on PSCell are assigned to the UE prior to the start of time period T3 to the end of T4.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table A.7.4.3.1-3: DRX-Configuration for E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

Field	PSCell	Comment	
	Value		
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset	sf320		
shortDRX	disable		
Note: For further information see clause 6.3.2 in TS 36.331.			

Table A.7.4.3.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD Interruption at transitions between active and non-active during DRX in asynchronous dual connectivity

Field	PSCell	Comment
Field	Value	
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.7.4.3.2 Test Requirements

The UE shall be scheduled on PCell continuously during the whole time duration T1. During time durations T1, at least 99% of all expected ACK/NACKs shall be transmitted on PCell by the UE.

Each interruption shall not exceed 1 subframe.

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

A.7.5 Proximity-based Services

A.7.5.1 E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test

A.7.5.1.1 Test Purpose and Environment

The purpose of this test is to verify the timing requirements for ProSe Direct Discovery transmissions when PCell downlink timing is used as a reference with $N_{\rm TA,SL}=0$. This test will verify the requirements in clause 7.16.2.1.1.1 ProSe Direct Discovery transmissions. In the test the UE under test is configured for ProSe operation only on PCell and also the UE is configured only for PCell for WAN.

For this test, the UE is triggered by the test loop function or the upper layers to announce ProSe Direct Discovery.

The test parameters are given in Table A.7.5.1.1-1 below. There is one active cell (PCell) in this test. The transmit timing is verified using the transmission timing of PSDCH.

Table A.7.5.1.1-1: Test parameters for ProSe Transmission Timing Accuracy test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth (BW _{channel})	MHz	5	
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
drx-Configuration		DRX_P1	As specified in Table A.3.12.2-
ProSe Direct Discovery resource pool configuration		As specified in Table A.3.12.4-1 (Configuration #1)	IE values unless specified otherwise in this test.
PDCCH/PCFICH/PHICH Reference measurement channel Note1		R.11 FDD	
OCNG Pattern ^{Note2}		OP.16 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RB OCNG_RA ^{Note3}	dB	0	
OCNG_RB $^{\text{Note3}}$	dBm/15 kHz	-98	
$\hat{E_s}/N_{oc}$	dB	3	
RSRP Note4	dBm/15 kHz	-95	
SCH_RP Note 4	dBm/15 kHz	-95	
Propagation condition Note 1: For the reference measurement of		AWGN	

Note 1: For the reference measurement channels, see clause A.3.1.

A.7.5.1.2 Test Requirements

For parameters specified in Tables A.7.5.1.1-1, the timing accuracy for ProSe Direct Discovery transmissions shall be within the limits defined in clause 7.16.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 5MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED DRX with a cycle length of 320ms:

- a) After a connection is set up with the cell, the test system shall verify that the ProSe UE transmit timing offset is within $\pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by $+32\times T_S$ (approximately $+1\mu s$) compared to that in (a). The test system shall wait for at least one discovery period (320ms) before verifying the requirement again in (c).
- c) The test system shall verify that the UE transmit timing offset stays within \pm 12×T_S with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

Note 2: For the OCNG pattern, see clause A.3.2.

Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.7.5.2 E-UTRAN TDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test

A.7.5.2.1 Test Purpose and Environment

The purpose of this test is to verify the timing requirements for ProSe Direct Discovery transmissions when PCell downlink timing is used as a reference with $N_{\rm TA,SL}=0$. This test will verify the requirements in clause 7.16.2.1.1.1 for ProSe Direct Discovery transmissions. In the test the UE under test is configured for ProSe operation only on PCell and also the UE is configured only for PCell for WAN.

For this test, the UE is triggered by the test loop function or the upper layers to announce ProSe Direct Discovery.

The test parameters are given in Table A.7.5.2.1-1 below. There is one active cell (PCell) in this test. The transmit timing is verified using the transmission timing of PSDCH.

Table A.7.5.2.1-1: Test parameters for ProSe Transmission Timing Accuracy test for E-UTRAN TDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth (BW _{channel})	MHz	5	
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
Uplink/Downlink Configuration		Config 0	
Special Subframe Configuration		6	
CP length of Cell 1		Normal	
drx-Configuration		DRX_P1	As specified in Table A.3.12.2-
ProSe Direct Discovery resource pool configuration		As specified in Table A.3.12.4-3 (Configuration #3)	IE values unless specified otherwise in this test.
PDCCH/PCFICH/PHICH Reference measurement channel Note1		R.11 TDD	
OCNG Pattern ^{Note2}		OP.10 TDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RB OCNG_RA ^{Note3} OCNG_RB ^{Note3}	dB	0	
N_{oc}	dBm/15 kHz	-98	
\hat{E}_s/N_{oc}	dB	3	
RSRP Note4	dBm/15 kHz	-95	
SCH_RP Note 4	dBm/15 kHz	-95	
Propagation condition		AWGN	

Note 1: For the reference measurement channels, see clause A.3.1.

Note 2: For the OCNG pattern, see clause A.3.2.

Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.7.5.1.2 Test Requirements

For parameters specified in Tables A.7.5.2.1-1, the timing accuracy for ProSe Direct Discovery transmissions shall be within the limits defined in clause 7.16.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 5MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED DRX with a cycle length of 320ms:

- a) After a connection is set up with the cell, the test system shall verify that the ProSe UE transmit timing offset is within $624 \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by $+32 \times T_S$ (approximately $+1 \mu s$) compared to that in (a). The test system shall wait for at least one discovery period (320ms) before verifying the requirement again in (c).
- c) The test system shall verify that the UE transmit timing offset stays within $624 \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

A.7.5.3 E-UTRAN FDD - Interruptions due to ProSe Direct Discovery

A.7.5.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirements related to the allowed PCell interruptions due to ProSe Direct Discovery defined in clause 7.16.3.1 and clause 7.16.3.3. In the test the UE under test is configured for ProSe operation only on PCell and also the UE is configured only for PCell for WAN.

For this test, the UE is triggered by the test loop function or the upper layers to monitor ProSe Direct Discovery.

The test parameters are given in Table A.7.5.3.1-1 and Table A.7.5.3.1-2 below. There is one active cell (PCell) in this test and 24 active Sidelink transmissions in this test (with 12 active Sidelink UEs per configured discovery subframe). Two tests (Test 1 and Test 2) are defined to verify interruptions due to synchronous (Test 1) and asynchronous (Test 2) ProSe Direct Discovery.

The tests consist of three successive time periods, with time duration of T1, T2 and T3 respectively.

During T1, the UE is in RRC_IDLE and monitoring the ProSe Direct Discovery announcements from other active Sidelink UEs on the ProSe Direct Discovery resources.

During T2, the test system establishes a RRC connection with the UE. No PDSCH traffic is scheduled for UE during T2, and the UE is expected to transmit *SidelinkUEInformation* indicating *discRxInterest* during T2. On reception of *SidelinkUEInformation*, the test system shall RRC reconfiguration message to the UE and wait for the UE to respond with RRC reconfiguration complete message before transitioning to T3. If the UE does not transmit *SidelinkUEInformation* for up to [2] sec, the test system shall transition to T3.

During T3, the UE is scheduled with PDSCH traffic on PCell downlink. The test system will count the missed ACK/NACKs during T3 to verify the allowed interruptions during ProSe Direct Discovery.

Table A.7.5.3.1-1: Test parameters for interruption due to ProSe Direct Discovery tests

Parameter	Unit	Value		Comment
Farameter	Onit	Test 1	Test 2	Comment
E-UTRA RF Channel Number		1		
Channel Bandwidth (BW _{channel})	MHz	63	5	
Active cell		Cell 1		E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Nor		
T1	S	5.12		
T2	S	Up to receiving RRC reconfiguration setup complete from the UE, or up to [2] sec if UE does not transmit SidelinkUEInformation during this period.		
Т3	S	10.	24	

Table A.7.5.3.1-2: ProSe Direct Discovery configuration for interruption due to ProSe Direct Discovery tests

Domenator	l lm it	Value		Comment	
Parameter	Unit	Test 1	Test 2	Comment	
E-UTRA RF Channel Number		1	1	UL carrier frequency	
Channel Bandwidth (BW _{channel})	MHz	5	5		
ProSe Direct Discovery resource pool configuration		As specified in Table A.3.12.4-1 (Configuration #1)	As specified in Table A.3.12.4-2 (Configuration #2)	IE values unless specified otherwise in this test.	
Active Sidelink UEs Configuration		PDP.1.FDD As specified in Table A.3.12.8.2-1	PDP.2.FDD As specified in Table A.3.12.8.2-1	Transmitting ProSe Direct Discovery (Test 1 and 2) and SLSS (for Test 2)	

Table A.7.5.3.1-3: Cell specific test parameters for interruption due to ProSe Direct Discovery tests

Daras	neter	Unit	Cell 1			
Parai	neter	Unit	T1	T2	T3	
E-UTRA RF Channel N	umber			1		
BW _{channel}		MHz		5		
UE RRC state			IDLE	CONN	IECTED	
Paging configuration	defaultPagingCycle nB		rf256 T / 32	-	√A	
DRX			N/A	С)FF	
PDSCH Reference mea defined in A.3.1.1.1 Note1	asurement channel		N/A	None	R.5 FDD	
PDCCH/PCFICH/PHICI	H Reference defined in A.3.1.2.1 ^{Note1}			R.11 FDD		
OCNG Pattern				OP.16 FDD		
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB		dB		0		
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA ^{Note 1}						
OCNG_RB ^{Note 1}						
$N_{oc}^{ m Note2}$		dBm/15 kHz	-98			
\hat{E}_s/N_{oc}		dB		16		
RSRP Note3		dBm/15 kHz		-82		
SCH_RP Note 3		dBm/15 kHz		-82		
Propagation Condition				AWGN		
density is acl	be used such that cell is fon hieved for all OFDM symb from other cells and noise	ols.				

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

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

A.7.5.3.2 Test Requirements

The UE shall be scheduled on PCell continuously during T3.

In Test 1, at least 98.75% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE. The missed ACK/NACKs can occur only on subframe 'n', if either n±1 subframe is a discovery subframe, or if n-3, or n-5 is a discovery subframe.

NOTE: For the test configuration in Table A.7.5.3.1-1 and Table A.7.5.3.1-2, the specific subframes where missed ACK/NACKs are allowed are when (subframe mod 320) = 159, 163, 162, 166, corresponding to allowed interruptions on subframe 159 and 162.

In Test 2, at least 97.5% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE. The missed ACK/NACK can occur only on subframe 'n', if either n±5 subframe is a discovery or SLSS subframe, or if n+1, or n-9 is a discovery or SLSS subframe.

NOTE: For the test configuration in Table A.7.5.3.1-1 and Table A.7.5.3.1-2, the specific subframes where missed ACK/NACKs are allowed are when (subframe mod 320) = 135, 139, 145, 149, 155, 159, 166, 170, corresponding to allowed interruptions on subframes 135, 145, 155 and 166.

A.7.5.4 E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test

A.7.5.4.1 Test Purpose and Environment

The purpose of this test is to verify the timing requirements for ProSe Direct Communication transmissions when PCell downlink timing is used as a reference with $N_{\rm TA,SL}=0$. This test will verify the requirements in clause 7.16.2.1.1.1 for ProSe Direct Communication transmissions. In the test the UE under test is configured for ProSe operation only on PCell and also the UE is configured only for PCell for WAN.

For this test, the UE is triggered by the test loop function or the upper layers to transmit for ProSe Direct Communication.

The test parameters are given in Table A.7.5.4.1-1 below. There is one active cell (PCell) in this test. The test system will configure the ProSe UE to transmit SLSS in each period (40ms) by configuring *networkControlledSyncTx* as ON via dedicated RRC signaling. The transmit timing is verified using the transmission timing of SLSS transmissions.

Table A.7.5.4.1-1: Test parameters for ProSe Transmission Timig Accuracy test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth (BW _{channel})	MHz	5 or 10	Note 5
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
drx-Configuration		DRX_P1	As specified in Table A.3.12.2-1
ProSe Direct Communication configuration		As specified in Table A.3.12.5-1 (Configuration #1)	IE values unless specified otherwise in this test.
networkControlledSyncTx		ON	Configured
PDCCH/PCFICH/PHICH Reference measurement channel ^{Note1}		5 MHz: R.11 FDD 10 MHz: R.6 FDD	
OCNG Pattern ^{Note2}		5 MHz: OP.16 FDD 10 MHz: OP.2 FDD	
PBCH_RA			
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA	dB	0	
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA ^{Note3}			
OCNG_RB ^{Note3}			
N_{oc}	dBm/15 kHz	-98	
\hat{E}_{s}/N_{oc}	dB	3	
RSRP Note4	dBm/15 kHz	-95	
SCH_RP Note 4	dBm/15 kHz	-95	
Propagation condition		AWGN	

Note 1: For the reference measurement channels, see clause A.3.1.

Note 2: For the OCNG pattern, see clause A.3.2.

Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: This test is according to the principle defined in section A.3.12.3.

A.7.5.4.2 Test Requirements

For parameters specified in Tables A.7.5.4.1-1, the timing accuracy for ProSe Direct Communication transmissions shall be within the limits defined in clause 7.16.2. The timing accuracy is verified using SLSS transmissions.

The following sequence of events shall be used to verify that the requirements are met.

For 5MHz or 10MHz channel bandwith, the test sequence shall be carried out in RRC_CONNECTED DRX with a cycle length of 320ms:

- a) After a connection is set up with the cell, the test system shall verify that the ProSe UE SLSS transmission timing offset is within \pm 12×T_S with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by +32×T_S (approximately +1μs) compared to that in (a). The test system shall wait for at least one SLSS period (40ms) before verifying the requirement again in (c).
- c) The test system shall verify that the UE SLSS transmissiontiming offset stays within \pm 12×T_S with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

A.7.5.5 E-UTRAN FDD - Interruptions due to ProSe Direct Communication

A.7.5.5.1 Test Purpose and Environment

The purpose of this test is to verify the requirements related to PCell interruptions due to ProSe Direct Communication defined in clause 7.16.3. In the test the UE under test is configured for ProSe operation only on PCell and also the UE is configured only for PCell for WAN.

For this test, the UE is triggered by the test loop function or the upper layers to monitor ProSe Direct Communication.

The test parameters are given in Table A.7.5.5.1-1, Table A.7.5.5.1-2 and Table A.7.5.5.1-3 below. There is one active cell (PCell) in this test and 12 (5MHz) or 16 (10 MHz) active Sidelink UEs in this test transmitting ProSe Direct Communication.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively.

During T1, the UE is in RRC_IDLE and monitoring the ProSe Direct Communication transmission from other active Sidelink UEs on the ProSe Direct Communication resoruces.

During T2, the test system establishes a RRC connection with the UE. No PDSCH traffic is scheduled for UE during T2, and the UE is expected to transmit *SidelinkUEInformation* indicating *commRxInterestedFreq* during T2. On reception of *SidelinkUEInformation*, the test system shall RRC reconfiguration message to the UE and wait for the UE to repond with RRC reconfiguration complete message before transitioning to T3. If the UE does not transmit *SidelinkUEInformation* for up to [2] sec, the test system shall transition to T3.

During T3, the UE is scheduled with PDSCH traffic on PCell downlink. The test system will count the missed ACK/NACKs during T3 to verify the allowed interruptions during ProSe Direct Communication (no missed ACK/NACKs are allowed).

Table A.7.5.5.1-1: Test parameters for interruption due to ProSe Direct Communication tests

Parameter	Unit	Value	Comment		
E-UTRA RF Channel Number		1			
Channel Bandwidth (BW _{channel})	MHz	5 or 10	According to principle defined in clause A.3.12.3		
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1		
CP length of Cell 1		Normal			
T1	S	5.12			
T2	s	Up to receiving RRC reconfiguration setup complete from the UE, or up to [2] sec if UE does not transmit SidelinkUEInformation during this period.			
Т3	S	10.24			
Note 1: This test is according to the principle defined in section A.3.12.3.					

Table A.7.5.5.1-2: ProSe Direct Communication specific configuration for interruption due to ProSe Direct Communication tests

Parameter	Unit	Value	Comment		
E-UTRA RF Channel Number		1	UL carrier frequency		
Channel Bandwidth (BW _{channel})	MHz	5 or 10	According to principle defined in clause A.3.12.3		
ProSe Direct Communication configuration		As specified in Table A.3.12.5-1 (Configuration #1)	IE values unless specified otherwise in this test.		
Active Sidelink UEs Configuration Note 1 Active Sidelink UEs Configuration PCP.1.FDD As specified in Table A.3.12.8.1-1 Transmitting ProSe Direct Communication (PSCCH + PSSCH)					

Table A.7.5.5.1-2: Cell specific test parameters for interruption due to ProSe Direct Communication tests

Parameter		Unit	Cell 1		
Гата	illetei	Offic	T1	T2	T3
E-UTRA RF Channel N	umber			1	
BW _{channel} Note 4		MHz		5 or 10	
UE RRC state			IDLE	CONN	ECTED
	defaultPagingCycle		rf256		
Paging configuration	nB		T / 32	N	/A
DRX			N/A	0	FF
PDSCH Reference measurement channel defined in A.3.1.1.1 Note 1, Note 4			N/A	None	R.7 FDD (5MHz) or R.3 FDD (10MHz) (Note 5 applies)
PDCCH/PCFICH/PHIC measurement channel of	H Reference defined in A.3.1.2.1 ^{Note1,}			5 MHz: R.11 FDI 10 MHz: R.6 FDI	
Note 4			'	O IVII IZ. N.O FDI	
OCNG Pattern Note 4			10	5 MHz: OP.16 0 MHz: OP.2 FD)D
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB		dB	0		
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA ^{Note 1}					
OCNG_RB ^{Note 1}					
$N_{oc}^{ m Note2}$		dBm/15 kHz		-98	
\hat{E}_s/N_{oc}		dB		16	
RSRP Note3		dBm/15 kHz		-82	
SCH_RP Note 3		dBm/15 kHz	-82		
Propagation Condition				AWGN	
density is ac	be used such that cell is the hieved for all OFDM symbol from other cells and noise	ools.			
	Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.				
Note 3: RSRP levels parameters t	Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				
Note 5: The PDSCH following bitr	following bitmap that repeats every 40ms.				
PDSCH scheduled subframe bitmap: {01110111 11110111 11110111 11110110}.					

A.7.5.5.2 Test Requirements

The UE shall be scheduled on PCell continuously during T3. During T3, 100% of all expected ACK/NACKs shall be transmitted by the ProSe UE.

A.8 UE Measurements Procedures

The reference channels in this clause assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified.

A.8.1 E-UTRAN FDD Intra-frequency Measurements

A.8.1.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

A.8.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in clause 8.1.2.2.1.1.

The test parameters are given in Table A.8.1.1.1-1 and A.8.1.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1.1.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1
parameters		Channel R.6 FDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	5	

Table A.8.1.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Ce	ell 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		1			1	
Number						
BW _{channel}	MHz	•	10		10	
Correlation Matrix and		1x2	Low	1	x2 Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	I FDD	OI	P.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB		_			
PHICH_RA	dB		0	0		
PHICH_PB	dB					
PDCCH_RA	dB					
PDCCH_PB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
$N_{oc}^{ m Note~3}$	dBm/15 KHz			-98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition			E	TU70		

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.1.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

A.8.1.2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

A.8.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in clause 8.1.2.2.1.1

The test parameters are given in Table A.8.1.2.1-1 and A.8.1.2.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1.2.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1
parameters		Channel R.6 FDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in clause A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	s	5	

Table A.8.1.2.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Се	Cell 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1		1	
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		1x2	Low	1)	2 Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OP	.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB		_			
PHICH_RA	dB	(0	0		
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
$N_{oc}^{ m Note~3}$	dBm/15 KHz			-98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition		ETU70				

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.1.2.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.3 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

A.8.1.3.1 Test Purpose and Environment

The purpose of the two tests is to verify that the UE makes correct reporting of an event in DRX. The tests will partly verify the FDD-FDD intra-frequency cell search in DRX requirements in clause 8.1.2.2.1.2.

The test parameters are given in Tables A.8.1.3.1-1, A.8.1.3.1-2, A.8.1.3.1-3 and A.8.1.3.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.1.3.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in clause A.3.1.2.1
Active cell		Cell 1		
Neighbour cell		Ce	II 2	Cell to be identified.
E-UTRA RF Channel Number		1		One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	1	0	
A3-Offset	dB	-6		
CP length		Normal		
Hysteresis	dB	0		
Time To Trigger	S	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table A.8.1.3.1-3
Time offset between cells		3 μs		Synchronous cells
T1	S	5		
T2	S	5	30	

Table A.8.1.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1			Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1	1		
Number						
BW _{channel}	MHz	•	10		10	
Correlation Matrix and		1x2	Low	1>	2 Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.	1 FDD	OP	.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB		_			
PHICH_RA	dB		0	0		
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
$N_{oc}^{ m Note 2}$	dBm/15 KHz	-98				
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition		ETU70				

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

Table A.8.1.3.1-3: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
rieid	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

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

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

Table A.8.1.3.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
rieid	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.1.3.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement

reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.1.4 Void

A.8.1.5 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

A.8.1.5.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.2.3.

The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.8.1.5.1-1 and A.8.1.5.1-2. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

Table A.8.1.5.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	ms	3	Asynchronous cells
T1	S	5	
T2	S	≤10	
T3	s	5	

Table A.8.1.5.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.10	OP.10	OP.10	OP.2	OP.2	OP.2
A.3.2.1.10 (OP.10 FDD)		FDD	FDD	FDD	FDD	FDD	FDD
and in A.3.2.1.2 (OP.2							
FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB		_			_	
PHICH_RA	dB		0			0	
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						

$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{ m Note 2}$	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					

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

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

A.8.1.5.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

 $Test\ requirement = RRC\ Procedure\ delay +\ T_{identify_CGI,intra} + reporting\ delay$

- = 15 + 150 + 2ms from the start of T3
- = 167 ms, allow 170 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall 80 ACK/NACK number is caused by two parts. Firstly, at least 60 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.1.2.2.3.1.

Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

A.8.1.6 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

A.8.1.6.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.2.3. The requirement is verified in a DRX configuration.

The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.8.1.6.1-1, A.8.1.6.1-2, A.8.1.6.1-3 and A.8.1.6.1-4. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

Table A.8.1.6.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.1.6.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	ms	3	Asynchronous cells
T1	S	5	
T2	S	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	S	5	

Table A.8.1.6.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit		Cell 1		_	Cell 2	_
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.1.1 (OP.1 FDD) and		FDD	FDD	FDD	FDD	FDD	FDD
in A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB		_			_	
PHICH_RA	dB		0			0	
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						

$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{ m Note~2}$	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					

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

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

Table A.8.1.6.1-3: DRX configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.1.6.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.1.6.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

 $Test\ requirement\ = RRC\ Procedure\ delay\ +\ T_{identify_CGI,intra}\ +\ reporting\ delay$

= 15 + 150 + 2ms from the start of T3

= 167 ms, allow 170 ms.

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

A.8.1.7 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS

A.8.1.7.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects and reports Event A3 (Neighbour becomes offset better than PCell) defined in TS 36.331 [2] within the requirements specified in Clause 8.1.2.8.1.1 under a time domain measurement resource restriction and non-MBSFN ABS configured in the aggressor cell.

The test parameters are given in Tables A.8.1.7.1-1 and A.8.1.7.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A3 is used. In the test there are two synchronous cells, Cell 1 and Cell 2, on the same RF channel. Cell 1 is the PCell, and it is also the aggressor cell to Cell 2. Cell 2 is the cell to be identified. The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 2.

Non-MBSFN ABS pattern is configured for Cell 1 during the test. The UE is configured by higher layers via Cell 1 with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells. The UE is also configured with a time domain measurement resource restriction pattern for the PCell measurements. The information for both measurement patterns shall be provided to the UE via higher layers during T1.

Table A.8.1.7.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference	As specified in clause A.3.1.1.1
·		Measurement Channel	·
		R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference	As specified in clause A.3.1.2.1
parameters		Measurement Channel	
		R.6 FDD	
PCell		Cell 1	Also the aggressor cell. Active in T1 and T2
Neighbour cell		Cell 2	Cell to be identified. Active only in T2.
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Channel Bandwidth (BW _{channel})	MHz	10	For all cells in the test
A3-Offset	dB	-11	
Event A3 measurement quantity		RSRP	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	5	
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6 !=0	Cell PCIs are selected so that the condition is met
ABS pattern			FDD ABS Pattern Info IE, as defined in TS
·		10000000100000001000	36.423 [28], clause 9.2.54. Configured in Cell 1
		00001000000010000000	during T1.
			The first/leftmost bit corresponds to the
			subframe #0 of the radio frame satisfying SFN
			mod x = 0, where x is the size of the bit string
			(40) divided by 10. No MBSFN subframes are
			cofigured in the ABS subframes.
Time domain measurement			Time domain measurement resource restriction
resource restriction pattern for		100000010000001000	pattern for neighbor cell measurement signalled
neighbour cell measurements on		00001000000010000000	to the UE in measSubframePattern-Neigh IE in
RF Channel 1			measSubframePatternConfig-Neigh, as defined
			in TS 36.331, clause 6.3.5.
		(-,	Configured during T1 for Cell 2 measurements.
Time domain measurement		'0100000010000000100	Configured during T1 for Cell 1 measurements
resource restriction pattern for		00000100000001000000	
PCell measurements			

Table A.8.1.7.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Ce	II 1	(Cell 2	
		T1 T2		T1	T2	
E-UTRA RF Channel		,	1		1	
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		1x2	Low	1:	x2 Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.5		OP.5	FDD	OF	P.6 FDD	
(OP.5 FDD) and in						
A.3.2.1.6 (OP.6 FDD)						
PBCH_RA	dB	Non-ABS and	ABS subframe			
PBCH_RB	dB		ers defined in			
PSS_RA	dB	Table A.:	3.4.1.1-1.			
SSS_RA	dB					
PCFICH_RB	dB				_	
PHICH_RA	dB				0	
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~3}$	dBm/15 kHz		-	98		
$(\hat{E}_s/N_{oc})_{meas}^{ ext{Note 5}}$	dB	1	1	-Infinity	-4	
(\hat{E}_s/N_{oc})ABS	dB	1	1	N/A	N/A	
RSRP Note 4,5	dBm/15 kHz	-97	-97	-Infinity	-102	
SCH_RP Note 4	dBm/15 kHz	-97	-97	-Infinity	-102	
CRS $\hat{E}_{_{s}}/I_{_{ot}}$	dB	1	-0.5	-Infinity	-4	
SCH $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	1	-0.5	-Infinity	-7.5	
Propagation Condition	_		ET	U30		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted						

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled. Applies to all subframes.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSPP is estimated for Cell 2 during the restricted measurement subframes for neighbour cells. RSPP is estimated for Cell 1 during the PCell restricted subframes.

A.8.1.7.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for Cell 2, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event-triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for the tested Event A3.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.8.1.8.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in TS 36.331 [2] within the requirements specified in Clause 8.1.2.8.3, when the UE is provided with a time-domain measurement resource restriction pattern and CRS assistance information, and when non-MBSFN ABS configured in the interfering cells.

The test parameters are given in Tables A.8.1.8.1-1 and A.8.1.8.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A3 is used. In the test, there are three synchronous cells, Cell 1, Cell 2, and Cell 3, on the same RF channel. Cell 1 is the PCell. Cell 3 is the cell to be identified. A non-MBSFN ABS pattern is configured in each of the Cell 1 and Cell 2 during the entire test. The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 3.

The UE is configured by higher layers with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, nsamely Cell 3 measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement patterns and the CRS assistance information shall be provided via RRC to the UE during T1.

Table A.8.1.8.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Para	meter	Unit	Value	Comment
PDSCH parame				As specified in clause A.3.1.1.1
-			Channel R.0 FDD	
PCFICH/PDCCI parameters	H/PHICH		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
PCell			Cell 1	Also a first interfering cell to Cell 3. Active in T1 and T2.
Neighbour cells			Cell 2 and Cell 3	Cell 2 is a second interfering cell; Cell 2 is active in T1 and T2. Cell 3 is the cell to be identified; Cell 3 is active only in T2.
ABS transmission	on configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
E-UTRA RF Cha			1	One FDD carrier frequency is used
Channel Bandw	ridth (BW _{channel})	MHz	10	For all cells in the test
A3-Offset	, , , , , , , , , , , , , , , , , , , ,	dB	-14	
Event A3 measu	urement quantity		RSRP	
CP length			Normal	
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
Time offset betv	veen cells	μs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells
T1		S	5	
T2		S	5	
Physical cell IDs	6		(PCI _{cell1} - PCI _{cell3})mod6 = 0 (PCI _{cell2} - PCI _{cell3})mod6 != 0 PCI _{cell1} not equal to PCI _{cell3}	Cell PCIs are selected so that all conditions are met
ABS pattern			'100000001000000100000 001000000010000000	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in Cell 1 and Cell 2 during T1.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'1000000010000000100000 00100000001000000	Time domain measurement resource restriction pattern for neighbor cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured during T1 for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time domain me resource restrict PCell measuren	tion pattern for		'01000000100000010000 000100000001000000'	Configured during T1 for Cell 1 measurements
	physCellId see PCI conditions above		see PCI conditions above	The CRS assistance information is
CRS assistance	antennaPortsC ount		1	provided for Cell 2 only in CRS- AssistanceInfo. It includes a single
information	istance		oneFrame = '000000'	MBSFN-SubframeConfig element with subframe allocation one Frame='000000'.

Table A.8.1.8.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Damana dan	1111	Cel	Cell 1		Cell 2		Cell 3	
Parameter	Unit	T1	T2	T1	T2	T1	T2	
E-UTRA RF Channel		1		1		1		
Number		'		<u> </u>		I		
BW _{channel}	MHz	10	0	1	0	1	0	
Correlation Matrix and		1x2	Low	1v2	Low	1v2	Low	
Antenna Configuration		172	LOW	172	LOW	172	LOW	
OCNG Patterns defined in							OP.6	
A.3.2.1.5 (OP.5 FDD) and		OP.5	FDD	OP.6	FDD	N/A	FDD	
in A.3.2.1.6 (OP.6 FDD)							100	
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB	Non-ABS	and ADC	Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.		N/A		
PHICH_RA	dB	subframe						
PHICH_RB	dB	powers d					0	
PDCCH_RA	dB	Table A.3						
PDCCH_RB	dB	Table A.S). 4 . . ⁻ .					
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$N_{oc}^{ m Note 3}$	dBm/15				98			
TV oc	kHz			-	90			
(\hat{E}_s/N_{oc})	dB	4	4	2	2	-Infinity	-4	
RSRP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-102	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-102	
${\sf CRS}\hat{E}_{\sf s}/I_{\sf ot}^{\sf Note5}$	dB	4	2.54	2	0.54	-Infinity	-9.46	
SCH $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	-0.12	-0.75	-3.45	-3.92	-Infinity	-11.07	
Propagation Condition		ETU	J30	ET	J30	ETI	J30	

NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant

over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

NOTE 4: RSRP, SCH_RP, and $\hat{E}_{_{s}}/I_{_{ot}}$ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

NOTE 5: Applies during the restricted measurement subframes configured for neighbour cell (Cell 3) measurements.

A.8.1.8.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for Cell 3, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event-triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for the tested Event A3.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.9 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth

A.8.1.9.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.1.1.1.

The parameters of this test are the same as defined in Subclause A.8.1.1.1 except that the values of the parameters in the Table A.8.1.9.1-1 will replace the values of the corresponding parameters in A.8.1.1.1-1, and the values of the parameters in the Table A.8.1.9.1-2 will replace the values of the corresponding parameters in A.8.1.1.1-2.

Table A.8.1.9.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth

Parameter	Unit	Value	Comment		
PDSCH parameters	DL Reference Measurement Channel R.5 FDD		As specified in clause A.3.1.1.1		
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1		
parameters	s Channel R.11 FDD				
Note 2: This test is according to the principle defined in section A.3.7.2.					

Table A.8.1.9.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz

Parameter	Unit	Cell 1		(Cell 2	
		T1	T1 T2		T2	
BW _{channel}	MHz	5			5	
OCNG Patterns defined in A.3.2.1 (OP.15 FDD) and A.3.2.1.16 (OP.16 FDD)		OP.15	FDD	OP.16 FDD		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: See Table A.8.1.1.1-2 for the other parameters.						

A.8.1.9.2 Test Requirements

The test requirements defined in section A.8.1.1.2 shall apply to this test case.

A.8.1.10 E-UTRAN FDD-FDD Intra-Frequency Event Triggered Reporting under Fading Propagation Conditions in Synchronous Cells with DRX for 5 MHz Bandwidth

A.8.1.10.1 Test Purpose and Environment

The purpose of the two tests is to verify that the UE makes correct reporting of an event in DRX. The tests will partly verify the FDD-FDD intra-frequency cell search in DRX requirements in clause 8.1.2.2.1.2.

The parameters of this test are the same as defined in Section A.8.1.3.1 except that the values of the parameters in the Table A.8.1.10.1-1 will replace the values of the corresponding parameters in A.8.1.3.1-1, and the values of the parameters in the Table A.8.1.10.1-2 will replace the values of the corresponding parameters in A.8.1.3.1-2.

Table A.8.1.10.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment		
		Test 1	Test 2			
PDSCH parameters		DL Reference Measurement Channel R.5 FDD		As specified in clause A.3.1.1.1		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD		As specified in clause A.3.1.2.1		
Channel Bandwidth	MHz	5				
(BW _{channel})						
NOTE 1: See Table A.8.1.3.1-1 for the other parameters. NOTE 2: This test is according to the principle defined in Section A.3.7.2.						

Table A.8.1.10.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		(Cell 2	
		T1	T2	T1	T2	
BW _{channel}	MHz	5		5		
OCNG Patterns						
defined in A.3.2.1.15		OP.15 FDD		OP.16 FDD		
(OP.15 FDD) and in						
A.3.2.1.16 (OP.16						
FDD)						
NOTE 1: See Table A.8	NOTE 1: See Table A.8.1.3.1-2 for the other parameters.					

A.8.1.10.2 Test Requirements

The test requirements defined in Section A.8.1.3 shall apply to this test case.

A.8.1.11 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0

A.8.1.11.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in clause 8.5.2.1.1.

The test parameters are given in Table A.8.1.11.1-1 and A.8.1.11.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1.11.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 FDD	As specified in clause A.3.1.1.3
PCFICH/PDCCH/PHICH		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
parameters Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	5	

Table A.8.1.11.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Ce	ell 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		1			1	
Number						
BW _{channel}	MHz		0		10	
Correlation Matrix and		2	x1		2x1	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OI	P.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB	(0		0	
PHICH_PB	dB					
PDCCH_RA	dB					
PDCCH_PB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
$N_{oc}^{ m Note 3}$	dBm/15 KHz	-98				
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition			E	TU70		

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.1.11.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.12 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0

A.8.1.12.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in clause 8.5.2.1.1

The test parameters are given in Table A.8.1.12.1-1 and A.8.1.12.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1.12.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 FDD	As specified in clause A.3.1.1.3
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1
parameters		Channel R.6 FDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel		1	One FDD carrier frequency is used.
Number			
Channel Bandwidth	MHz	10	
(BW _{channel})			
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in clause A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	5	

Table A.8.1.12.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1 T1 T2		Cell 2		
				T1	T2	
E-UTRA RF Channel		1		1		
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		2:	x1		2x1	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OP.2 FDD		
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB			0		
SSS_RA	dB					
PCFICH_RB	dB		_			
PHICH_RA	dB	(0			
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
$N_{oc}^{ m Note 3}$	dBm/15 KHz	-98			•	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 4	dBm/15 KHz	-94 -94		-Infinity	-94	
Propagation Condition		ETU70				

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.1.12.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.13 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0

A.8.1.13.1 Test Purpose and Environment

The purpose of the two tests is to verify that the UE makes correct reporting of an event in DRX. The tests will partly verify the FDD-FDD intra-frequency cell search in DRX requirements in clause 8.5.2.1.1.2.

The test parameters are given in Tables A.8.1.13.1-1, A.8.1.13.1-2, A.8.1.13.1-3 and A.8.1.13.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.1.13.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment	
		Test 1	Test 2		
PDSCH parameters		DL Reference Measurement Channel R.13 FDD		As specified in clause A.3.1.1.3	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in clause A.3.1.2.1	
Active cell		Cell 1			
Neighbour cell		Cell 2		Cell to be identified.	
E-UTRA RF Channel Number		1		One FDD carrier frequency is used.	
Channel Bandwidth (BW _{channel})	MHz	1	0		
A3-Offset	dB	-6			
CP length		Normal			
Hysteresis	dB	0			
Time To Trigger	S	0			
Filter coefficient		0		L3 filtering is not used	
DRX		ON		DRX related parameters are defined in Table A.8.1.13.1-3	
Time offset between cells		3 μs		Synchronous cells	
T1	S	5			
T2	S	5	30		

Table A.8.1.13.11-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1		1		
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		2:	x1	2x1		
Antenna Configuration				<u> </u>		
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OP.2 FDD		
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB			0		
SSS_RA	dB					
PCFICH_RB	dB		_			
PHICH_RA	dB	()			
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
$N_{oc}^{ m Note 2}$	dBm/15 KHz	-98			•	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 3	dBm/15 KHz	-94 -94		-Infinity	-94	
Propagation Condition		ETU70				

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

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

Table A.8.1.13.1-3: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
Fleid	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.8.1.13.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
Field	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.1.13.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.1.14 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category

A.8.1.14.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in clause 8.5.2.1.2.1.

The test parameters are given in Table A.8.1.14.1-1 and A.8.1.14.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1.14.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.3.1.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	5	

Table A.8.1.14.1-2: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Ce	ll 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1		1	
Number						
BW _{channel}	MHz		0		10	
Correlation Matrix and		2	x1		2x1	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OI	P.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB			0		
PHICH_RA	dB	(0			
PHICH_PB	dB					
PDCCH_RA	dB					
PDCCH_PB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
$N_{oc}^{ m Note 3}$	dBm/15 KHz	-98				
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition			E	TU70		

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.1.14.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.15 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0

A.8.1.15.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in clause 8.5.2.1.2.1

The test parameters are given in Table A.8.1.15.1-1 and A.8.1.15.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1.15.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.3
parameters		Channel R.3 HD-FDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in clause A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	5	

Table A.8.1.15.1-2: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Се	ell 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		1		1		
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		2	x1		2x1	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OP	.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB		_	0		
PHICH_RA	dB	(0			
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
$N_{oc}^{ m Note 3}$	dBm/15 KHz			-98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition		ETU70				

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{
m ac}$ to be

RSRP and SCH_RP levels have been derived from other parameters for information purposes. Note 4: They are not settable parameters themselves.

A.8.1.15.2 **Test Requirements**

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.16 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0

A.8.1.16.1 Test Purpose and Environment

The purpose of the two tests is to verify that the UE makes correct reporting of an event in DRX. The tests will partly verify the FDD-FDD intra-frequency cell search in DRX requirements in clause 8.5.2.1.2.2.

The test parameters are given in Tables A.8.1.16.1-1, A.8.1.16.1-2, A.8.1.16.1-3 and A.8.1.16.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.1.16.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment		
		Test 1	Test 2			
PDSCH parameters		DL Reference Me		As specified in clause A.3.1.1.4		
PCFICH/PDCCH/PHICH parameters		Channel R.1 HD-FDD DL Reference Measurement Channel R.3 HD-FDD		As specified in clause A.3.1.2.3		
Active cell		Cell 1				
Neighbour cell		Ce	II 2	Cell to be identified.		
E-UTRA RF Channel Number		1		1		One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	1	0			
A3-Offset	dB	-6				
CP length		Normal				
Hysteresis	dB	0				
Time To Trigger	S	0				
Filter coefficient		0		L3 filtering is not used		
DRX		ON		DRX related parameters are defined in Table A.8.1.16.1-3		
Time offset between cells		3 μs		Synchronous cells		
T1	S	5				
T2	S	5	30			

Table A.8.1.16.1-2: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Се	II 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		1		1		
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		2:	x1		2x1	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OF	P.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB		_			
PHICH_RA	dB	(0	0		
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
\hat{E}_{s}/I_{ot}	dB	4	-1.46	-Infinity	-1.46	
$N_{oc}^{ m Note 2}$	dBm/15 KHz	-98			•	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition				TU70	•	
Note 1: OCNG shall be used	d such that both calls ar	a fully allocated	and a constant to	tal transmitted now	or epoctral density is	

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

Table A.8.1.16.1-3: DRX-Configuration for E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
rieiu	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

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

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

Table A.8.1.16.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
Field	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.1.16.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.1.17 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

A.8.1.17.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD intra-frequency cell search requirements in clause 8.5.2.1.3.1.

The test parameters are given in Table A.8.1.17.1-1 and A.8.1.17.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1.17.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
		DL Reference Measurement	
PDSCH parameters		Channel R.12 TDD	As specified in clause A.3.1.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in clause A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	5	

Table A.8.1.17.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Се	II 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1		1	
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		2:	κ1		2x1	
Antenna Configuration						
OCNG Pattern defined						
in A.3.2.2.1 (OP.1		OP.1	TDD	OP	2.2 TDD	
TDD) and in A.3.2.2.2						
(OP.2)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB			0		
PHICH_RA	dB					
PHICH_RB	dB	()			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note 3}$	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	
\hat{E}_{s}/I_{ot}	dB	4	-1.46	-Infinity	-1.46	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
Propagation Condition			E	TU70	•	

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.1.17.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.18 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

A.8.1.18.1 Test Purpose and Environment

The purpose of the two tests is to verify that the UE makes correct reporting of an event in DRX. The tests will partly verify the TDD-TDD intra-frequency cell search in DRX requirements in clause 8.5.2.1.3.2.

The test parameters are given in Tables A.8.1.18.1-1, A.8.1.18.1-2, A.8.1.18.1-3 and A.8.1.18.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.1.18.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2]
		DL Reference	Measurement	
PDSCH parameters		Channel R.12	TDD	As specified in clause A.3.1.1.5
		DL Reference	Measurement	
PCFICH/PDCCH/PHICH		Channel R.6 T	DD	As specified in clause A.3.1.2.2
parameters				
Active cell		Cell 1		
Neighbour cell		Ce	ell 2	Cell to be identified.
E-UTRA RF Channel Number		•	1	One TDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211.
				The same configuration in both cells
Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211.
				The same configuration in both cells
Hysteresis	dB	0		
Time To Trigger	S	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in
				Table A.8.1.18.1-3
Time offset between cells		3 μs		Synchronous cells
T1	S	5		
T2	s	5	30	

Table A.8.1.18.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Се	II 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1		1	
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		2:	κ1		2x1	
Antenna Configuration						
OCNG Pattern defined						
in A.3.2.2.1 (OP.1		OP.1	TDD	OF	P.2 TDD	
TDD) and in A.3.2.2.2						
(OP.2)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB			0		
PCFICH_RB	dB					
PHICH_RA	dB		_			
PHICH_RB	dB	()			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~2}$	dBm/15 kHz			-98		
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-94	
\hat{E}_{s}/I_{ot}	dB	4	-1.46	-Infinity	-1.46	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-94	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
Propagation Condition			E	TU70	•	

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

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

Table A.8.1.18.1-3: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
Fleid	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.8.1.18.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
Fleid	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

A.8.1.18.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

A.8.1.19.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.5.2.1.4.

The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.8.1.19.1-1 and A.8.1.19.1-2. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

Table A.8.1.19.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.15 FDD	As specified in clause A.3.1.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	S	5	
T2	S	≤10	
T3	S	5	

Table A.8.1.19.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit		Cell 1			Cell 2			
		T1	T2	T3	T1	T2	T3		
E-UTRA RF Channel			1		1				
Number									
BW _{channel}	MHz		10			10			
Correlation Matrix and			2x1			2x1			
Antenna Configuration									
OCNG Patterns defined in		OP.10	OP.10	OP.10	OP.2	OP.2	OP.2		
A.3.2.1.10 (OP.10 FDD)		FDD	FDD	FDD	FDD	FDD	FDD		
and in A.3.2.1.2 (OP.2									
FDD)									
PBCH_RA	dB								
PBCH_RB	dB		0			0			
PSS_RA	dB		-3		-3				
SSS_RA	dB								
PCFICH_RB	dB		0		0				
PHICH_RA	dB		-3		-3				
PHICH_PB	dB								
PDCCH_RA	dB		0		0				
PDCCH_PB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB		-3		-3				
OCNG_RANote 1	dB								
OCNG_RB ^{Note 1}	dB		T.	T			T		
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36		
N_{oc} Note 2	dBm/15 KHz	-98							
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11		
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87		
SCH_RP Note3	dBm/15 KHz	-90 -90 -90 -Infinity -87 -87							
Propagation Condition		AWGN							
Timing offset to Cell 1	ms		-			3			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral									

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

A.8.1.19.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify CGI LC-UE, intra}$ + reporting delay

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210 ms at least 112 ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall 112 ACK/NACK number is caused by two parts. Firstly, at least 92 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.5.2.1.4. Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 210 ms excludes 190 ms for identifying the cell global identifier of cell 2.

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

A.8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

A.8.1.20.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.5.2.1.4. The requirement is verified in a DRX configuration.

The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.8.1.20.1-1, A.8.1.20.1-2, A.8.1.20.1-3 and A.8.1.20.1-4. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

Table A.8.1.20.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.14 FDD	As specified in clause A.3.1.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.1.6.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	S	5	
T2	S	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	S	5	

Table A.8.1.20.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1		1		
Number							
BW _{channel}	MHz		10			10	
Correlation Matrix and			2x1			2x1	
Antenna Configuration							
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.1.1 (OP.1 FDD) and		FDD	FDD	FDD	FDD	FDD	FDD
in A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB		-3		-3		
SSS_RA	dB						
PCFICH_RB	dB		0		0		
PHICH_RA	dB		-3		-3		
PHICH_PB	dB						
PDCCH_RA	dB		0		0		
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB		-3		-3		
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{ m Note2}$	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90 -90 -90 -Infinity -87				-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms		-			3	
		she that hath calle are fully allocated and a constant total transmitted may are study					

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

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

Table A.8.1.20.1-3: DRX configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.1.20.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.1.20.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

 $Test\ requirement\ = RRC\ Procedure\ delay+\ T_{identify\ CGI\ LC-UE,\ intra}+reporting\ delay$

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

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

A.8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

A.8.1.21.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.5.2.1.5.

The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.8.1.21.1-1 and A.8.1.21.1-2. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

Table A.8.1.21.1-1: General test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters			As specified in clause A.3.1.1.4
		Channel R.2 HD-FDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.3
		Channel R.3 HD-FDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	S	5	
T2	S	≤10	
T3	S	5	

Table A.8.1.21.1-2: Cell specific test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1		1		
Number							
BW _{channel}	MHz		10			10	
Correlation Matrix and			2x1			2x1	
Antenna Configuration							
OCNG Patterns defined in		OP.10	OP.10	OP.10	OP.2	OP.2	OP.2
A.3.2.1.10 (OP.10 FDD)		FDD	FDD	FDD	FDD	FDD	FDD
and in A.3.2.1.2 (OP.2							
FDD)							
PBCH_RA	dB						
PBCH_RB	dB		0			0	
PSS_RA	dB		-3		-3		
SSS_RA	dB						
PCFICH_RB	dB		0		0		
PHICH_RA	dB		-3		-3		
PHICH_PB	dB				 		
PDCCH_RA	dB		0		0		
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB		-3		-3		
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz						-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms		-			3	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral							

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

A.8.1.21.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify CGI LC-UE, intra}$ + reporting delay

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210 ms at least 112 ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall 112 ACK/NACK number is caused by two parts. Firstly, at least 92 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.5.2.1.5. Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 210 ms excludes 190 ms for identifying the cell global identifier of cell 2.

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

A.8.1.22 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

A.8.1.22.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.5.2.1.5. The requirement is verified in a DRX configuration.

The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.8.1.22.1-1, A.8.1.22.1-2, A.8.1.22.1-3 and A.8.1.22.1-4. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

Table A.8.1.22.1-1: General test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.2 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.3.1.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.1.6.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	S	5	
T2	S	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	S	5	

Table A.8.1.22.1-2: Cell specific test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1		1		
Number							
BW _{channel}	MHz		10			10	
Correlation Matrix and			2x1			2x1	
Antenna Configuration							
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.1.1 (OP.1 FDD) and		FDD	FDD	FDD	FDD	FDD	FDD
in A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB					_	
PSS_RA	dB		-3		-3		
SSS_RA	dB						
PCFICH_RB	dB		0		0		
PHICH_RA	dB		-3		-3		
PHICH_PB	dB						
PDCCH_RA	dB		0		0		
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB		-3		-3		
OCNG_RANote 1	dB						
OCNG_RB ^{Note 1}	dB		1	1			1
\hat{E}_{s}/I_{ot}	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{ m Note~2}$	dBm/15 KHz			-(98		
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz						-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms		-			3	
	ota 1: OCNG shall be used such that both calls are fully allocated and a constant total transmitted nower spectral						

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

Table A.8.1.22.1-3: DRX configuration for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

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

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

Table A.8.1.22.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.1.22.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

 $Test\ requirement\ = RRC\ Procedure\ delay+\ T_{identify_CGI_LC-UE,\ intra}+reporting\ delay$

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

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

A.8.2 E-UTRAN TDD Intra-frequency Measurements

A.8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

A.8.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD intra-frequency cell search requirements in clause 8.1.2.2.2.1.

The test parameters are given in Table A.8.2.1.1-1 and A.8.2.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.2.1.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in clause A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	5	

Table A.8.2.1.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit				Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1	1		
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		1x2	Low	1)	2 Low	
Antenna Configuration						
OCNG Pattern defined						
in A.3.2.2.1 (OP.1		OP.1	TDD	OF	2.2 TDD	
TDD) and in A.3.2.2.2						
(OP.2)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB			0		
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB		_			
PHICH_RB	dB	()			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note 3}$	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	
\hat{E}_{s}/I_{ot}	dB	4	-1.46	-Infinity	-1.46	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
Propagation Condition			E	TU70		

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

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.2.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled

A.8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

A.8.2.2.1 Test Purpose and Environment

The purpose of the two tests is to verify that the UE makes correct reporting of an event in DRX. The tests will partly verify the TDD-TDD intra-frequency cell search in DRX requirements in clause 8.1.2.2.1.2.

The test parameters are given in Tables A.8.1.3.1-1, A.8.1.3.1-2, A.8.1.3.1-3 and A.8.1.3.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.2.2.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment		
		Test 1	Test 2	1		
		DL Reference	Measurement			
PDSCH parameters		Channel R.0 T	DD	As specified in clause A.3.1.1.2		
		DL Reference	Measurement			
PCFICH/PDCCH/PHICH		Channel R.6 T	DD	As specified in clause A.3.1.2.2		
parameters						
Active cell		Cell 1				
Neighbour cell		Ce	ell 2	Cell to be identified.		
E-UTRA RF Channel Number		1		1		One TDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10				
A3-Offset	dB	-6				
CP length		Normal				
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211.		
				The same configuration in both cells		
Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211.		
				The same configuration in both cells		
Hysteresis	dB	0				
Time To Trigger	S	0				
Filter coefficient		0		L3 filtering is not used		
DRX		ON		DRX related parameters are defined in		
				Table A.8.2.2.1-3		
Time offset between cells		3 μs		Synchronous cells		
T1	S	5				
T2	S	5	30			

Table A.8.2.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

E-UTRA RF Channel Number BW _{channel} Correlation Matrix and Antenna Configuration OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2) PBCH_RA PBCH_RB PSS_RA SSS_RA	MHz	1x2	T2 1 0 Low	T1	1 10 (2 Low	
Number BW _{channel} Correlation Matrix and Antenna Configuration OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2) PBCH_RA PBCH_RB PSS_RA	MHz	1 1x2	0	1x	10	
BW _{channel} Correlation Matrix and Antenna Configuration OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2) PBCH_RA PBCH_RB PSS_RA	MHz	1x2		1x		
Correlation Matrix and Antenna Configuration OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2) PBCH_RA PBCH_RB PSS_RA	MHz	1x2		1x		
Antenna Configuration OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2) PBCH_RA PBCH_RB PSS_RA			Low	1x	2104	
OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2) PBCH_RA PBCH_RB PSS_RA		OD 4			∠ LUW	
in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2) PBCH_RA PBCH_RB PSS_RA		OD 4				
TDD) and in A.3.2.2.2 (OP.2) PBCH_RA PBCH_RB PSS_RA		OD 4				
(OP.2) PBCH_RA PBCH_RB PSS_RA		UP.1	TDD	OP	.2 TDD	
PBCH_RA PBCH_RB PSS_RA	1					
PBCH_RB PSS_RA						
PSS_RA	dB					
	dB					
SSS_RA	dB			0		
	dB					
PCFICH_RB	dB					
PHICH_RA	dB		_			
PHICH_RB	dB	()			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N_{oc} Note 2 dB	Bm/15 kHz	-98				
RSRP Note 3 dB	3m/15 kHz	-94	-94	-Infinity	-94	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
Bloke '/	3m/15 kHz	-94	-94	-Infinity	-94	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
Propagation Condition						

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

Table A.8.2.2.1-3: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
rieid	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

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

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

Table A.8.2.2.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1 Test2		Comment
rieid	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

A.8.2.2.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.2.3 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

A.8.2.3.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.2.4.

The test scenario comprises of one E-UTRA TDD carrier and two cells as given in tables A.8.2.3.1-1 and A.8.2.3.1-2. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

Table A.8.2.3.1-1: General test parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

Table A.8.2.3.1-2: Cell specific test parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1 Cell 2					
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.2.1 (OP.1 TDD) and		TDD	TDD	TDD	TDD	TDD	TDD
in A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB		_			_	
PHICH_RA	dB		0			0	
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
\hat{E}_{s}/I_{ot}	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{ m Note~2}$	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Note 1: OCNG shall be us	sed such that both	cells are fully	y allocated a	nd a constai	nt total trans	mitted powe	r spectral
density is achieved for all OFDM symbols.							

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

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

A.8.2.3.2 **Test Requirements**

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify CGI.intra}$ + reporting delay

= 15 + 150 + 2ms from the start of T3

= 167 ms, allow 170 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 47 ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall 47 ACK/NACK number is caused by two parts. Firstly, at least 35 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement for UL/DL configuration #1 in Table 8.1.2.2.4.1-1 of Clause 8.1.2.2.4.1. Secondly, given that continuous DL data allocation, additional 12 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

A.8.2.4 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

A.8.2.4.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.2.4. The requirement is verified in a DRX configuration.

The test scenario comprises of one E-UTRA TDD carrier and two cells as given in tables A.8.2.4.1-1, A.8.2.4.1-2, A.8.2.4.1-3 and A.8.2.4.1-4. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

Table A.8.2.4.1-1: General test parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.2.4.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
T2	S	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	s	5	
=		1 =	II.

Table A.8.2.4.1-2: Cell specific test parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1		1		
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.2.1 (OP.1 TDD) and		TDD	TDD	TDD	TDD	TDD	TDD
in A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB	0 0					
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{ m Note~2}$	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition				AW	'GN		
	sed such that both	cells are full	y allocated a	nd a consta	nt total trans	mitted powe	r spectral
density is achieved for all OFDM symbols							

density is achieved for all OFDM symbols.

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

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

Table A.8.2.4.1-3: DRX configuration for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.2.4.1-4: TimeAlignmentTimer - Configuration for E-UTRAN TDD - TDD Intra frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.2.4.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify CGI, intra}$ + reporting delay

- = 15 + 150 + 2ms from the start of T3
- = 167 ms, allow 170 ms.

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

A.8.2.5 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS

A.8.2.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects and reports Event A3 (Neighbour becomes offset better than PCell) defined in TS 36.331 [2] within the requirements specified in Clause 8.1.2.8.2.1 under a time domain measurement resource restriction and non-MBSFN ABS configured in the aggressor cell.

The test parameters are given in Tables A.8.2.5.1-1 and A.8.2.5.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A3 is used. In the test there are two synchronous cells, Cell 1 and Cell 2, on the same RF channel. Cell 1 is the PCell, and it is also the aggressor cell to Cell 2. Cell 2 is the cell to be identified. The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 2.

Non-MBSFN ABS pattern is configured for Cell 1 during the test. The UE is configured by higher layers via Cell 1 with a time domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells. The UE is also configured with a time domain measurement resource restriction pattern for the PCell measurements. The information for both measurement patterns shall be provided to the UE via higher layers during T1.

Table A.8.2.5.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
		DL Reference Measurement	
PDSCH parameters		Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
PCell		Cell 1	Also the aggressor cell. Active in T1 and T2
Neighbour cell		Cell 2	Cell to be identified. Active only in T2.
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	One TDD damer frequency is used.
A3-Offset	dB	-11	
Event A3 measurement quantity	QD.	RSRP	
CP length		Normal	
Special subframe configuration		6	As specified in Table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	s	5	
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6 != 0	Cell PCIs are selected so that the condition is met
ABS pattern		'00000000010000000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1 during T1. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are cofigured in the ABS subframes.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'000000001000000001'	Time domain measurement resource restriction pattern for neighbor cell measurement signalled to the UE in measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331, clause 6.3.5. Configured during T1 for Cell 2 measurements.
Time domain measurement resource restriction pattern for PCell measurements		'100000000100000000'	Configured during T1 for Cell 1 measurements

Table A.8.2.5.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T1	T2		
E-UTRA RF Channel		1			1		
Number							
BW _{channel}	MHz	10		10			
Correlation Matrix and		1x2	1x2 Low		1x2 Low		
Antenna Configuration							
OCNG Pattern defined							
in A.3.2.2.1 (OP.1		OP.1	OP.1 TDD		OP.2 TDD		
TDD) and in A.3.2.2.2							
(OP.2)							
PBCH_RA	dB	Non-ABS and					
PBCH_RB	dB	channel power					
PSS_RA	dB	Table A.3	Table A.3.4.1.1-1.				
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB				0		
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{$	dBm/15 kHz	-98					
$(\hat{E}_s / N_{oc})_{meas}^{\hspace{1em}Note 5}$	dB	1	1	-Infinity	-4		
(\hat{E}_s/N_{oc})ABS	dB	1	1	N/A	N/A		
RSRP Note 4,5	dBm/15 kHz	-97	-97	-Infinity	-102		
SCH_RP Note 4	dBm/15 kHz	-97	-97	-Infinity	-102		
CRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	1	-0.5	-Infinity	-4		
SCH $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	1	-0.5	-Infinity	-7.5		
Propagation Condition			Е	TU30			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power							

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSPP is estimated for Cell 2 during the restricted measurement subframes for neighbour cells. RSPP is estimated for Cell 1 during the PCell restricted subframes.

A.8.2.5.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for Cell 2, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event-triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for the tested Event A3.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.8.2.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in TS 36.331 [2] within the requirements specified in Clause 8.1.2.8.4, when the UE is provided with a time-domain measurement resource restriction pattern and CRS assistance information, and when non-MBSFN ABS configured in the interfering cells.

The test parameters are given in Tables A.8.2.6.1-1 and A.8.2.6.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A3 is used. In the test, there are three synchronous cells, Cell 1, Cell 2, and Cell 3, on the same RF channel. Cell 1 is the PCell. Cell 3 is the cell to be identified. A non-MBSFN ABS pattern is configured in each of the Cell 1 and Cell 2 during the entire test. The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 3.

The UE is configured by higher layers with a time domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, nsamely Cell 3 measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement patterns and the CRS assistance information shall be provided via RRC to the UE during T1.

Table A.8.2.6.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter U		Value	Comment		
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2		
PCell		Cell 1	Also a first interfering cell to Cell 3. Active in T1 and T2.		
Neighbour cells		Cell 2 and Cell 3	Cell 2 is a second interfering cell; Cell is active in T1 and T2. Cell 3 is the cell to be identified; Cell 3 is active only in T2.		
ABS transmission configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1		
E-UTRA RF Channel Number		1	One TDD carrier frequency is used		
Channel Bandwidth (BW _{channel})	MHz	10	For all cells in the test		
A3-Offset	dB	-14			
Event A3 measurement quantity		RSRP			
CP length		Normal			
Special subframe configuration		6	As specified in Table 4.2-1 in TS 36.211. The same configuration in both cells		
Uplink-downlink configuration		1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells		
Hysteresis	dB	0			
Time To Trigger	S	0			
Filter coefficient		0	L3 filtering is not used		
DRX			OFF		
Time offset between cells	μѕ	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells		
T1	S	5			
· _	-				
T2	S	5			
T2 Physical cell IDs	-		Cell PCIs are selected so that all conditions are met		
	-	5 (PCI _{cell1} - PCI _{cell3})mod6 = 0 (PCI _{cell2} - PCI _{cell3})mod6 != 0	conditions are met TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided fto the UE for Cell 1 and Cell 2 during T1.		
Physical cell IDs ABS pattern Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1	S	5 (PCI _{cell1} - PCI _{cell3})mod6 = 0 (PCI _{cell2} - PCI _{cell3})mod6 != 0 PCI _{cell1} not equal to PCI _{cell3}	conditions are met TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided fto the UE for Cell 1 and Cell 2 during T1. Time domain measurement resource restriction pattern for neighbor cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Provided to the UE during T1 for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.		
Physical cell IDs ABS pattern Time domain measurement resource restriction pattern for neighbour cell measurements on	S	5 (PCI _{cell1} - PCI _{cell3}) mod6 = 0 (PCI _{cell2} - PCI _{cell3}) mod6 != 0 PCI _{cell1} not equal to PCI _{cell3} '000000000100000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided fto the UE for Cell 1 and Cell 2 during T1. Time domain measurement resource restriction pattern for neighbor cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Provided to the UE during T1 for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain		
Physical cell IDs ABS pattern Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1 Time domain measurement resource restriction pattern for	S	5 (PCI _{cell1} - PCI _{cell3}) mod6 = 0 (PCI _{cell2} - PCI _{cell3}) mod6 != 0 PCI _{cell1} not equal to PCI _{cell3} '0000000001000000001' '000000000100000000	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided fto the UE for Cell 1 and Cell 2 during T1. Time domain measurement resource restriction pattern for neighbor cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Provided to the UE during T1 for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.		

mbsfn-		MBSFN-SubframeConfig element with
SubframeConfi	oneFrame = '000000'	subframe allocation one
gList		Frame='000000'.

Table A.8.2.6.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter E-UTRA RF Channel Number BW _{channel} Correlation Matrix and	MHz	T1 1	T2	T1	T2	T1	T2	
Number BW _{channel}	MHz	-						
BW _{channel}	MHz	-			1		1	
	MHz	10	I		1		1	
Correlation Matrix and		10		10		10		
Considerent Matrix and		1x2 Low		1x2 Low		1x2 Low		
Antenna Configuration								
OCNG Patterns defined in		OP.1 TDD					OP.2 TDD	
A.3.2.2.1 (OP.1 TDD) and				OP.2 TDD		N/A		
in A.3.2.2.2 (OP.2 TDD)								
PBCH_RA	dB					ı		
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB	Non-ABS and ABS subframe channel		Non-ABS and ABS				
PHICH_RA	dB							
PHICH_RB	dB			subframe channel		N/A	0	
PDCCH_RA	dB	powers defined in Table A.3.4.1.1-1.		powers defined in Table A.3.4.1.1-1.				
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
	dBm/15	00						
$N_{oc}^{ m Note 3}$	kHz	-98						
(\hat{E}_s/N_{oc})	dB	4	4	2	2	-Infinity	-4	
RSRP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-102	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-102	
${\sf CRS}\hat{\sf E}_{\sf s}/{\sf I}_{\sf ot}^{\sf Note5}$	dB	4	2.54	2	0.54	-Infinity	-9.46	
SCH $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	-0.12	-0.75	-3.45	-3.92	-Infinity	-11.07	
Propagation Condition		ETU30		ETU30		ETU30		

- NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
- NOTE 4: RSRP, SCH_RP, and \hat{E}_s/I_{ot} levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- NOTE 5: Applies during the restricted measurement subframes configured for neighbour cell (Cell 3) measurements.

A.8.2.6.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for Cell 3, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event-triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for the tested Event A3.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

A.8.2.7.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.5.2.1.6.

The test scenario comprises of one E-UTRA TDD carrier and two cells as given in tables A.8.2.7.1-1 and A.8.2.7.1-2. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

Table A.8.2.7.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.5
·		Channel R.13 TDD	-
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.2
		Channel R.6 TDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	_
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	S	5	
T2	S	≤10	
T3	S	5	

Table A.8.2.7.1-2: Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Unit		Cell 1		Cell 2		
	T1	T2	T3	T1	T2	T3
	1				1	
MHz		10			10	
		2x1			2x1	
	-	_	_	-	_	OP.2
	TDD	TDD	TDD	TDD	TDD	TDD
		_			_	
		-3		-3		
_						
		0		0		
		-3		-3		
dB		0		0		
dB						
dB						
dB		-3		-3		
dB						
dB						
dB	8	-3.3	-3.3	-Infinity	2.36	2.36
dBm/15 KHz	-9			98		
dB	8	8	8	-Infinity	11	11
dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
	AWGN					
μs		-			3	
	MHz dB	MHz OP.1 TDD dB	MHz 10 OP.1 OP.1 TDD OP.1 DD OP.1 DD	MHz T1 T2 T3 MHz 10 2x1 OP.1	T1 T2 T3 T1 MHz 10 2x1 OP.1 OP.1 OP.2 OP.2 OP.2 OP.2 OP.2 OP.2 TDD TDD DD DP.2 TDD DP.2 TDD DP.2 DP.2 DP.2 DP.2 DP.2 DP.2 DP.2 TDD DP.2 DP.2 TDD DP.2 DP.2 LIN initial PR.2 DP.2 <td>T1 T2 T3 T1 T2 1 1 1 1 MHz 10 10 2x1 OP.1 OP.1 OP.2 OP.2 TDD TDD TDD TDD dB dB -3 -3 dB 0 0 0 dB 0 0 <</td>	T1 T2 T3 T1 T2 1 1 1 1 MHz 10 10 2x1 OP.1 OP.1 OP.2 OP.2 TDD TDD TDD TDD dB dB -3 -3 dB 0 0 0 dB 0 0 <

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

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

A.8.2.7.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 190 milliseconds from the start of T3.

 $Test\ requirement = RRC\ Procedure\ delay +\ T_{identify\ CGI\ LC-UE,\ intra} + reporting\ delay$

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 190 ms at least 66 ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall 66 ACK/NACK number is caused by two parts. Firstly, at least 54 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement for UL/DL configuration #1 in Table 8.1.2.2.4.1-1 of Clause 8.1.2.2.4.1. Secondly, given that continuous DL data allocation, additional 12 ACK/NACK shall be sent from the start of T3 until 210 ms excludes 190 ms for identifying the cell global identifier of cell 2.

A.8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

A.8.2.8.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.5.2.1.6. The requirement is verified in a DRX configuration.

The test scenario comprises of one E-UTRA TDD carrier and two cells as given in tables A.8.2.8.1-1, A.8.2.8.1-2, A.8.2.8.1-3 and A.8.2.8.1-4. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

Table A.8.2.8.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 TDD	As specified in clause A.3.1.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.2.4.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	S	5	
T2	S	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	S	5	

Table A.8.2.8.1-2: Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel		1				1	
Number							
BW _{channel}	MHz		10			10	
Correlation Matrix and			2x1			2x1	
Antenna Configuration							
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.2.1 (OP.1 TDD) and		TDD	TDD	TDD	TDD	TDD	TDD
in A.3.2.2.2 (OP.2 TDD)	-						
PBCH_RA	dB						
PBCH_RB	dB		_			_	
PSS_RA	dB		-3		-3		
SSS_RA	dB						
PCFICH_RB	dB		0		0		
PHICH_RA	dB		-3		-3		
PHICH_RB	dB						
PDCCH_RA	dB		0		0		
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB		-3		-3		
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{ m Note2}$	dBm/15 KHz	-9			98		
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition				AW	GN		
Timing offset to Cell 1	μs		-			3	
N							

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

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

Table A.8.2.8.1-3: DRX configuration for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.2.8.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Intra frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.2.8.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

 $Test\ requirement = RRC\ Procedure\ delay + \ T_{identify_CGI_LC-UE,\,intra} + reporting\ delay$

- = 15 + 190 + 2ms from the start of T3
- = 207 ms, allow 210 ms.

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

A.8.3 E-UTRAN FDD - FDD Inter-frequency Measurements

A.8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

A.8.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD-FDD inter-frequency cell search requirements in clause 8.1.2.3.

The test parameters are given in Tables A.8.3.1.1-1 and A.8.3.1.1-2. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.3.1.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	5	

Table A.8.3.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	C	ell 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1	2		
Number						
BW _{channel}	MHz		10		10	
Correlation Matrix and		1x2	? Low	1>	2 Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.	1 FDD	OF	2.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB		•	0		
PHICH_RB	dB		0			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~3}$	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
Propagation Condition				ETU70	•	
	d such that both calls ar	are fully allocated and a constant total transmitted power spectral density is				

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

A.8.3.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

A.8.3.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These test will partly verify the FDD-FDD inter-frequency cell search requirements when DRX is used in clause 8.1.2.3.

The common test parameters are given in Tables A.8.3.2.1-1 and A.8.3.2.1-2. DRX configuration for Test1 and Test2 are given in Table A.8.3.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.3.2.1-4. In this tests, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The tests consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.3.2.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment		
		Va	lue			
PDSCH parameters		DL Reference Measurement Channel R.0 FDD		DL Reference Measurement Channel R.0 FDD		As specified in clause A.3.1.1.1 Note that UE may only be allocated at <i>On Duration</i>
PCFICH/PDCCH/PHICH parameters		DL Reference Me Channel R.6 FDD		As specified in clause A.3.1.2.1.		
E-UTRA RF Channel Number		1,	2	Two FDD carrier frequencies are used.		
Channel Bandwidth (BW _{channel})	MHz	1	0			
Active cell		Cell 1		Cell 1 is on RF channel number 1		
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2		
Gap Pattern Id		0		As specified in TS 36.133 clause 8.1.2.1.		
A3-Offset	dB	-6				
Hysteresis	dB	0				
CP length		Normal				
TimeToTrigger	S	0				
Filter coefficient		0		L3 filtering is not used		
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211		
Access Barring Information	-	Not Sent		No additional delays in random access procedure.		
DRX		ON		DRX related parameters are defined in Table A.8.3.2.1-3		
Time offset between cells		3 ms		Asynchronous cells		
T1	S	5				
T2	S	5	30			

Table A.8.3.2.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

E-UTRA RF Channel Number BW _{channel} Correlation Matrix and	MHz	T1	T2	T1	T2	
Number BW _{channel}	MHz				2	
BW _{channel}	MHz	1			_	
	MHz	1				
Correlation Matrix and			0		10	
		1x2	Low	1x	2 Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OP	2.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB			0		
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	()			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N _{oc} Note 2	dBm/15 kHz			-98		
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
Propagation Condition			E	TU70		

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

Table A.8.3.2.1-3: drx-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment			
rieid	Value	Value				
onDurationTimer	psf1	psf1				
drx-InactivityTimer	psf1	psf1				
drx-RetransmissionTimer	psf1	psf1				
longDRX-CycleStartOffset	sf40	sf1280				
shortDRX	disable	disable				
Note: For further in	Note: For further information see clause 6.3.2 in TS 36.331.					

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

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

Table A.8.3.2.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
riela	Value	Value	
TimeAlianmentTimer	of500	sf500	For further information see
TimeAlignmentTimer	sf500	500 \$1500	clause 6.3.2 in TS 36.331.
			For further information see
sr-ConfigIndex	0 0	clause 6.3.2 in TS 36.331 and	
_			section10.1 in TS 36.213

A.8.3.2.2 Test Requirements

In Test1 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 20*1280ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report

A.8.3.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

A.8.3.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in DRX when L3 filtering is used. This test will partly verify the FDD-FDD inter-frequency cell search in DRX requirements in clause 8.1.2.3.1.2 and the UE behaviour with the *filterCoefficent* defined in TS 36.331 [2].

The test parameters are given in Tables A.8.3.3.1-1, A.8.3.3.1-2, A.8.3.3.1-3 and A.8.3.3.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 1 as defined in Table 8.1.2.1-1 is provided.

The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.3.3.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined in Table A.8.3.3.1-3
Time offset between cells		3 ms	Asynchronous cells
T1	S	30	
T2	S	9	

Table A.8.3.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

Parameter	Unit		Cell 1		(Cell 2	
		T1		T2	T1	T2	
E-UTRA RF Channel			1			2	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns							
defined in A.3.2.1.1			OP.1 FDD	1	OF	.2 FDD	
(OP.1 FDD) and in			טו וווטט			.2100	
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB				0		
PHICH_RB	dB		0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB					1	
${ m \hat{E}}_{ m s}/{ m I}_{ m ot}$	dB	4	4		4	24	
$N_{oc}^{ m Note~2}$	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	4	4		4	24	
RSRP Note 3	dBm/15 KHz	-94	-94		-94	-74	
SCH_RP Note 3	dBm/15 KHz	-94	-94		-94	-74	
Propagation Condition		AWGN	•		•	•	

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

Table A.8.3.3.1-3: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

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

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

Table A.8.3.3.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS
TimeAlignmentTimer	\$1500	36.331
		For further information see
sr-ConfigIndex	0	clause 6.3.2 in TS 36.331 and
		section10.1 in TS 36.213.

A.8.3.3.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6400 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.3.4 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

A.8.3.4.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.3.5.

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables A.8.3.4.1-1 and A.8.3.4.1-2. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE. Measurement gaps shall be deconfigured before the start of T3.

Table A.8.3.4.1-1: General test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
E-UTRA RF channel number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	ms	3	Asynchronous cells
T1	S	5	
T2	S	≤10	
T3	S	5	

Table A.8.3.4.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit		Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1		2			
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns defined in		OP.10	OP.10	OP.10	OP.2	OP.2	OP.2	
A.3.2.1.10 (OP.10 FDD)		FDD	FDD	FDD	FDD	FDD	FDD	
and in A.3.2.1.2 (OP.2								
FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB		0 0					
PHICH_PB	dB							
PDCCH_RA	dB							
PDCCH_PB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							

$\hat{ extsf{E}}_{ extsf{s}}/ extsf{I}_{ ext{ot}}$	dB	4	4	4	-Infinity	7	7
Noc Note 2	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					

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

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

A.8.3.4.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify CGI, inter}$ + reporting delay

- = 15 + 150 + 2ms from the start of T3
- = 167 ms, allow 170 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall 80 ACK/NACK number is caused by two parts. Firstly, at least 60 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.1.2.3.5.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional 20 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

A.8.3.5 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.3.5. The requirement is verified in a DRX configuration.

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables A.8.3.5.1-1, A.8.3.5.1-2, A.8.3.5.1-3 and A.8.3.5.1-4. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE. Measurement gaps shall be deconfigured before the start of T3.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

Table A.8.3.5.1-1: General test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
E-UTRA RF channel number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.3.5.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	S	5	

Table A.8.3.5.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			2	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.1.1 (OP.1 FDD) and		FDD	FDD	FDD	FDD	FDD	FDD
in A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		0		0		
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						

$\hat{ extsf{E}}_{ extsf{s}}/ extsf{I}_{ ext{ot}}$	dB	4	4	4	-Infinity	7	7
Noc Note 2	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					

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

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

Table A.8.3.5.1-3: DRX configuration for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.3.5.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.3.5.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify_CGI, inter}$ + reporting delay

= 15 + 150 + 2ms from the start of T3

= 167 ms, allow 170 ms.

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

A.8.3.6 E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells

A.8.3.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event without measurement gaps. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.

The test parameters are given in Tables A.8.3.6.1-1 and A.8.3.6.1-2. In this test, there are two cells on different carrier frequencies and no gaps are configured in this test. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. PDCCH on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

Table A.8.3.6.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting without measurement gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active PCell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	5	

Table A.8.3.6.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting without measurement gaps

Parameter	Unit	Cell 1		С	ell 2	
		T1 T2		T1	T2	
E-UTRA RF Channel			1		2	
Number						
BW _{channel}	MHz		10		10	
OCNG Patterns						
defined in A.3.2.1.10		OP.1	0 FDD	OP.	2 FDD	
(OP.10 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB			0		
PCFICH_RB	dB					
PHICH_RA	dB		0			
PHICH_RB	dB		U			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RANote 1	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~2}$	dBm/15 kHz			-98		
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4 4		-Infinity	7	
Propagation Condition				AWGN		
Note 1: OCNG shall be	e used such that bot	h cells are fully	/ allocated and	a constant total tra	nsmitted power	
	ty is achieved for all					

spectral density is achieved for all OFDM symbols.

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

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

A.8.3.6.2 **Test Requirements**

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall send continuous ACK/NACK throughout the test, and from the start of T2 until Event A3 is reported, at least 85% ACK/NACK shall be detected.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously. The rate of correct events observed during repeated tests shall be at least 90%.

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.3.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group

A.8.3.7.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD-FDD inter-frequency cell search requirements in clause 8.1.2.3.

The test parameters are given in Tables A.8.3.1.1-1 and A.8.3.1.1-2. In this test, there are four cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cells 2, 3 or 4.

Table A.8.3.7.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
UE configured E-UTRA RF		1, 2,3,4,5,6,7,8,9	Serving cell and eight FDD carrier
Channel Number			frequencies are used in the UE neighbour
			cell list.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cells		Cell 2, Cell 3, Cell 4	Cells 2, 3, 4 are randomly selected to use
			different frequencies selected from
			frequencies 2,3,4,5,6,7,8,9
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
Reduced Performance	-	8	
Group Scaling factor			
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
T1	S	5	
T2	S	40	

Table A.8.3.7.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells (Cell # 1 and Cell # 2)

Parameter	Unit	Cell 1		C	Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		•	1		selected from	
Number					such that cell 2 is	
					performance group	
BW _{channel}	MHz		$N_{RB} = 25$: N _{RB,} = 25	
			$N_{RB} = 50$		z: N _{RB,} = 50	
Measurement			10-15		z: 10-15	
bandwidth	n_{PRB}	TUMHZ	:: 22-27	1 UIVIF	Hz: 22-27	
PDSCH Reference		5MHz: F	R.5 FDD		-	
measurement channel		10MHz:	R.0 FDD			
defined in A.3.1.1.						
PDSCH allocation	10	5MHz	:: 7-17		-	
	n_{PRB}		:: 13-36			
PDCCH/PCFICH/PHIC			2.11 FDD		R.11 FDD	
H Reference		10MHz:	R.6 FDD	10MHz	z: R.6 FDD	
measurement channel						
defined in A.3.1.2.						
OCNG Patterns			P.15 FDD		OP.16 FDD	
defined in A.3.2.	-ID	10MHZ: C	DP.1 FDD	10MHz: OP.2 FDD		
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB PHICH_RA	dB dB					
PHICH_RB	dB	- ()		0	
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
Noc Note 3	dBm/15 kHz	-6	98		-98	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7	
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
SCH RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
lo ^{Note 4}	dBm/ BW _{channel}	-	-	-	-	
		64.76+10log(N _{RB,c} /50)	64.76+10log(N _{RB,} /50)	70.22+10log(N _{RB,} /50)	62.43+10log(N _R _{в.с} /50)	
Propagation Condition			J70		TU70	
Correlation Matrix and		1x2	Low		2 Low	
Antenna Configuration						
Timing offset to cell 1	ms		-		3	
	a used such that he	th colle are fully	allocated and a	constant total tr	anomitted newer	

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

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.

Note 4: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.3.7.1-3: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells (Cell # 3 and Cell # 4)

Parameter	Unit	Се	II 3	C	Cell 4		
		T1	T2	T1	T2		
E-UTRA RF Channel Number		Randomly selected from 2,3,4,5,6,7,8 such that cell 3 is in the normal performance group		2,3,4,5,6,7,8	selected from such that cell 4 is performance group		
BW _{channel}	MHz	5MHz: N	N _{RB} = 25 N _{RB} = 50		: N _{RB,} = 25 z: N _{RB,} = 50		
Measurement bandwidth	$n_{{\scriptscriptstyle PRB}}$	5MHz:	: 10-15 :: 22-27	5MH	z: 10-15 Iz: 22-27		
PDSCH Reference measurement channel defined in A.3.1.1.			-		-		
PDSCH allocation	$n_{\it PRB}$,	-		-		
PDCCH/PCFICH/PHIC H Reference measurement channel defined in A.3.1.2.			1.11 FDD R.6 FDD		R.11 FDD :: R.6 FDD		
OCNG Patterns		5MHz: OI	P.16 FDD	5MHz: (OP.16 FDD		
defined in A.3.2.		10MHz: 0	P.2 FDD	10MHz: OP.2 FDD			
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB	,	2		0		
PHICH_RB	dB	()		0		
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{ m Note 3}$	dBm/15 kHz		98		-98		
\hat{E}_s/N_{oc}	dB	-Infinity	7	-Infinity	7		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	-Infinity	7	-Infinity	7		
RSRP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91		
SCH_RP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91		
lo ^{Note 4}	dBm/ BW _{channel}	- 70.22+10log(N _{RB,c} /50)	- 62.43+10log(N _{RB,0} /50)	- 70.22+10log(N _{RB,} /50)	- 62.43+10log(N _R _{B,} √50)		
Propagation Condition			J70		TU70		
Correlation Matrix and			Low		2 Low		
Antenna Configuration							
Timing offset to cell 1	ms	;	3		3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power							

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.

Note 4: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.3.7.2 Test Requirements

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 30.72s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.3.8 FDD-FDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX

A.8.3.8.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD-FDD inter-frequency cell measurement requirements for increased UE carrier monitoring in clause 8.1.2.3.

The test parameters are given in Tables A.8.3.8.1-1, A.8.3.8.1-2 and A.8.3.8.1-3. In this test, there are 4 cells on different carrier frequencies and gap pattern configuration #0 as defined in table A.8.3.8.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Events A3 is used. The test consists of two successive time periods for every reptitation, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of neighoubour cells. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 8 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table A.8.3.8.1-1: General test parameters for FDD-FDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF		1,2,3,4,5,6,7,8,9	Serving cell and 8 FDD carrier frequencies
Channel Number			are used in the UE neighbour cell list.
			Frequencies 5,6,7,8 and 9 are indicated to
			have reduced performance
Test equipment		Cell 1 uses E-UTRA RF cannel	
configuration		number 1	
		Cell 2,3,4 are randomly selected	
		to use different frequencies	
		selected from frequencies	
		2,3,4,5,6,7,8,9	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Scaling factor configurations		8	As specified in TS 36.133 clause
			8.1.2.1.1a
T1	S	5	
T2	S	155	

Table A.8.3.8.1-2: Cell specific test parameters for FDD-FDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX (cell #1, cell #2)

Parameter	Unit	Cell 1		С	ell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel		,	1	Randomly sel	ected from 2,3,4		
Number				such that cell	2 is in the normal		
					ance group		
BW _{channel}		5MHz: N	$N_{RB} = 25$	5MHz:	N _{RB,} = 25		
		10MHz:	$N_{RB} = 50$: N _{RB,} = 50		
PDSCH parameters:			R.5 FDD		R.5 FDD		
DL Reference		10MHz:l	R.0 FDD	10MHz	::R.0 FDD		
Measurement Channel							
As specified in							
clause A.3.1.1.1							
PCFICH/PDCCH/PHIC			.11 FDD		R.11 FDD		
H parameters: DL		10MHz:l	R.6 FDD	10MHz	::R.6 FDD		
Reference							
Measurement Channel							
As specified in							
clause A.3.1.2.1							
OCNG Patterns		53411 01	2.45.500	5.41.1	ND 40 EDD		
defined in A.3.2.1.1,			P.15 FDD		OP.16.FDD		
A.3.2.1.2 ,A.3.2.1.15		10MHZ:C	P.1 FDD	10MHZ:	OP.2 FDD		
and A.3.2.1.16	-ID						
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB	+ ()		0		
PHICH_RB	dB	<u> </u>	•		·		
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA PDSCH_RB	dB dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
_	dBm/15 kHz	-	98		-98		
$N_{oc}^{ m Note 3}$	UDIII/13 KHZ		70				
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}^{\mathrm{Note 4}}$	dB	4	4	-Infinity	7		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
SCH RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
lo Note 4	dBm/Ch BW	-64.76	-64.76	-70.22	-62.43		
		+10log +10log		+10log	+10log		
		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)		
Propagation Condition			GN		WGN .		
Antenna Configuration		1x2 1x2					
Timing offset to Cell 1			-		Bms		
Note 1: OCNG shall be used such that both calls are fully allocated and a constant total transmitted nower							

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

over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant

Table A.8.3.8.1-3: Cell specific test parameters for FDD-FDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX (cell #3, cell #4)

Parameter	Unit	Ce	II 3	C	Cell 4
		T1	T2	T1	T2
E-UTRA RF Channel		Randomly s	elected from	Randomly	selected from
Number		5,6,7,8,9 sucl	n that cell 3 is		h that cell 4 is in
			educed		d performance
			nce group		4 RF channel is
		•	• .		rom Cell 3 RF
					annel.
BW _{channel}		5MHz: N	$N_{RB} = 25$	5MHz	: N _{RB,} = 25
			$N_{RB} = 50$		z: N _{RB,} = 50
PDSCH parameters:			R.5 FDD		R.5 FDD
DL Reference		10MHz:	R.0 FDD	10MH:	z:R.0 FDD
Measurement Channel					
As specified in					
clause A.3.1.1.1					
PCFICH/PDCCH/PHIC			1.11 FDD		R.11 FDD
H parameters: DL		10MHz:	R.6 FDD	10MH:	z:R.6 FDD
Reference					
Measurement Channel					
As specified in					
clause A.3.1.2.1					
OCNG Patterns					
defined in A.3.2.1.2			P.16.FDD		OP.16.FDD
and A.3.2.1.16		10MHz:C	P.2 FDD	10MHz	:OP.2 FDD
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB)		0
PHICH_RB	dB		J		U
PDCCH_RA	dB	_			
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB	_			
OCNG_RA ^{Note 1}	dB	1			
OCNG_RB ^{Note 1}	dB				
$N_{oc}^{ m Note~3}$	dBm/15 kHz		98		-98
\hat{E}_s/N_{oc}	dB	-Infinity	7	-Infinity	7
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}^{\mathrm{Note 4}}$	dB	-Infinity	7	-Infinity	7
RSRP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91
SCH RP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91
lo Note 4	dBm/Ch BW	-70.22 -62.43		-70.22	-62.43
		+10log +10log		+10log	+10log
		(N _{RB,c} /50) (N _{RB,c} /50)		(N _{RB,c} /50)	(N _{RB,c} /50)
Propagation Condition		AW	'GN	A	WGN
Antenna Configuration		1x2 1x2			1x2
Timing offset to Cell 1			ns	;	3ms
Note 1: OCNC shall be	a used such that he	th calla ara fully	allocated and a	aanatant tatal tr	anamittad navyar

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

Note 4: Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled

A.8.3.8.2 Test Requirements

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 13.17s (cell 2) and 153.6s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

A.8.3.9 FDD-FDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX

A.8.3.9.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in DRX. This test will partly verify the FDD-FDD inter-frequency cell search requirements when DRX is used in clause 8.1.2.3.

The test parameters are given in Tables A.8.3.9.1-1, A.8.3.9.1-2, A.8.3.9.1-3 and A.8.3.9.1-4. In this test, there are four cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

The UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle..

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2, 3 or 4. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 8 cells on different frequencies which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table A.8.3.9.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for IncMon

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1, 2,3,4,5,6,7,8,9	Serving cell and eight FDD carrier frequencies are used in the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are indicated to have reduced performance
Test equipment configuration		Cell 1,2,3,4	Cell 1 uses E-UTRA RF channel number 1 Cells 2 are randomly selected to use different frequencies selected from E-UTRA frequencies 2, 3, 4. Cells 3, 4 are randomly selected to use different frequencies selected from E-UTRA frequencies 5, 6, 7, 8, 9.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cells		Cell 2,3,4	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-5	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.3.9.1-3
Scaling factor for reduced performance group		8	
T1	S	5	
T2	S	155	

Table A.8.3.9.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for IncMon

Parameter	Unit		ell 1		ell 2	Cell 3		Cell 4	
		T1	T2	T1	T2	T1	T2	T1	T2
E-UTRA RF Channel			1		Randomly selected from 2,3,4 Randomly selected from 5, 6,				ected from 5, 6,
Number							at cell 3 is in the		
					nce group		rmance group		rmance group
Channel Bandwidth	MHz		NRB = 25		NRB,= 25		NRB = 25		IRB,= 25
(BW _{channel})			NRB = 50		NRB,= 50		NRB = 50		NRB,= 50
PDSCH parameters as specified in clause			R.5 FDD R.0 FDD		R.5 FDD R.0 FDD		R.5 FDD R.0 FDD		R.5 FDD R.0 FDD
A.3.1.1.1		I UIVIMZ.	K.0 FDD	TUIVINZ.	K.0 FDD	TUIVINZ.	K.0 FDD	TUIVINZ.	K.0 FDD
PCFICH/PDCCH/PHICH		5MHz: R	R.11 FDD	5MHz: F	R.11 FDD	5MHz: F	R.11 FDD	5MHz: B	1.11 FDD
parameters as specified			R.6 FDD		R.6 FDD		R.6 FDD		R.6 FDD
in clause A.3.1.2.1									
OCNG Patterns defined			P.15 FDD		P.16 FDD		P.16 FDD		P.16 FDD
in A.3.2.1		10MHz: (OP.1 FDD	10MHz: (OP.2 FDD	10MHz: (OP.2 FDD	10MHz: (OP.2 FDD
PBCH_RA	dB								
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB	(0	0		0		0	
PDCCH_RA	dB]					
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA ^{Note 1}	dB								
OCNG_RB ^{Note 1}	dB								
N_{oc} Note 3	dBm/15 kHz	-(98	-(-98 -98		-98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	-Infinity	4	-Infinity	4
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}^{\mathrm{Note 4}}$	dB	4	4	-Infinity	4	-Infinity	4	-Infinity	4
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	-Infinity	-94	-Infinity	-94
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	-Infinity	-94	-Infinity	-94
lo Note 4	dBm/Ch BW	-64.76+10log	-64.76+10log	-70.22+10log	-64.76+10log	-70.22+10log	-64.76+10log	-70.22+10log	-64.76+10log
		(N _{RB,c} /50)	$_{c}$ /50) $(N_{RB,c}$ /50) $(N_{RB,c}$		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)
Propagation Condition			/GN	AWGN		AWGN		AWGN	
Antenna Configuration		1:	x2	1x2		1x2		1x2	
Time offset to cell1	ms		-	;	3	;	3	;	3

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 4: E_s/I_{ot}, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.3.9.1-3: drx-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used for IncMon

Field	Value	Comment		
onDurationTimer	psf1			
drx-InactivityTimer	psf1			
drx-RetransmissionTimer	psf1			
longDRX-CycleStartOffset	sf160			
shortDRX	disable			
Note: For further information see clause 6.3.2 in TS 36.331.				

Table A.8.3.9.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used for IncMon

Field	Value	Comment
TimeAlignmentTimer	sf500	For further information see clause 6.3.2 in TS 36.331.
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213

A.8.3.9.2 Test Requirements

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 13.2s (cell 2) and 153.6s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

Where:

When DRX cycle is 160ms, the delay requirement of cell identification and measurement period are specified in section 8.1.2.3.1.2 and Non DRX Requirements in clause 8.1.2.3.1.1 are applicable.

The requirement of inter frequency cell identification delay are specified as

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter1}}} \cdot N_{\text{freq},n} \cdot K_n \quad \textit{ms} \text{ (normal performance) and } T_{\text{Inter1}} \cdot N_{\text{Inter2}} \cdot N_{\text{Inter3}} \cdot N_{\text{Inter4}} \cdot N_{\text$$

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter}}} \cdot N_{freq,r} \cdot K_r \quad \textit{ms} \, (\text{reduced performance})$$

T_{Basic Identify inter} 480ms, See section 8.1.2.3.1.1

T_{Inter1} 60ms, See section 8.1.2.1

 $N_{freq,n}$ and $N_{freq,r}$ 3 and 5 set in this test case.

 K_n and K_r 8/7 and 8, See section 8.1.2.1.1a.

This gives 13165.7ms for cells 2 on normal carrier, and 153600ms for cell 3 and cell 4 on reduced carriers for Event A3 triggered measurement reporting delay. The test requirements allow 13.2s and 153.6s.

A.8.4 E-UTRAN TDD - TDD Inter-frequency Measurements

A.8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

A.8.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD-TDD inter-frequency cell search requirements in clause 8.1.2.3.4.

The test parameters are given in Table A.8.4.1.1-1 and A.8.4.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.4.1.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
		DL Reference Measurement	
PDSCH parameters		Channel R.0 TDD	As specified in clause A.3.1.1.2
		DL Reference Measurement	
PCFICH/PDCCH/PHICH		Channel R.6 TDD	As specified in clause A.3.1.2.2
parameters			
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
			The same configuration in both cells
Uplink-downlink configuration		1	As specified in TS 36.211 clause 4.2 Table
			4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	s	10	

Table A.8.4.1.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T1	T2		
E-UTRA RF Channel		1		2			
Number							
BW _{channel}	MHz	1	0	1	0		
Correlation Matrix and		1x2	Low	1x2	Low		
Antenna Configuration							
OCNG Pattern defined							
in A.3.2.2.1 (OP.1		OP.1	TDD	OP.2	TDD		
TDD) and in A.3.2.2.2							
(OP.2)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB	0		0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7		
$N_{oc}^{ m Note~3}$	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7		
Propagation Condition		ETU70					

Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.4.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells

A.8.4.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These test will partly verify the TDD-TDD inter-frequency cell search requirements when DRX is used in clause 8.1.2.3.

The common test parameters are given in Tables A.8.4.2.1-1 and A.8.4.2.1-2. DRX configuration for Test1 and Test2 are given in Table A.8.4.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.4.2.1-4. In these tests, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignmend. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The tests consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.4.2.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Unit	Test 1	Test 2	Comment
	Value		7
	DL Reference Measurement		As specified in clause A.3.1.1.2. Note that
	Channel R.0 TDD)	UE may only be allocated at On Duration
	DL Reference Me	easurement	As specified in clause A.3.1.2.2.
	Channel R.6 TDD)	
	1,	2	Two TDD carrier frequencies are used.
MHz	1	0	
	Cell 1		Cell 1 is on RF channel number 1
	Cell 2		Cell 2 is on RF channel number 2
	0		As specified in TS 36.133 clause 8.1.2.1.
	1		As specified in TS 36.211 clause 4.2 Table
			4.2-2
	6		As specified in table 4.2-1 in TS 36.211.
			The same configuration in both cells
dB	-6		
dB	0		
	Normal		
S	0		
	0		L3 filtering is not used
	4		As specified in table 5.7.1-3 in TS 36.211
-	Not Sent		No additional delays in random access
			procedure.
	ON		DRX related parameters are defined in Table A.8.4.2.1-3
	3 us		Synchronous cells
S	5		
S	5	30	
	MHz dB dB s	Va DL Reference Me Channel R.0 TDE DL Reference Me Channel R.6 TDE 1,	Value UL Reference Measurement Channel R.0 TDD DL Reference Measurement Channel R.6 TDD 1, 2 MHz 10 Cell 1 Cell 2 0 1 6 dB dB -6 dB 0 Normal s 0 4 - Not Sent ON 3 μs s 5

Table A.8.4.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel		1		2			
Number							
BW _{channel}	MHz	10			10		
Correlation Matrix and		1x2	Low	1)	<2 Low		
Antenna Configuration							
OCNG Patterns							
defined in A.3.2.2.1		OP.1	TDD	OF	2.2 TDD		
(OP.1 TDD) and in							
A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		•				
PHICH_RB	dB	0		0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98					
RSRP Note 3	dBm/15 kHz	-94 -94		-Infinity	-91		
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7		
SCH_RP Note 3	dBm/15 kHz	-94 -94		-Infinity	-91		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	-91 7		
Propagation Condition				ETU70	•		
	d such that both cells are fully allocated and a constant total transmitted nower spectral density is						

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

Table A.8.4.2.1-3: drx-Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
rield	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	·

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

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

Table A.8.4.2.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
rieid	Value	Value	
Time Alignment Timer	ofF00	sf500	For further information see
TimeAlignmentTimer	sf500		clause 6.3.2 in TS 36.331.
		2 2	For further information see
sr-ConfigIndex	2		clause 6.3.2 in TS 36.331 and 10.1
			in TS 36.213.

A.8.4.2.2 Test Requirements

In Test1 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 20*1280ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used

A.8.4.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in DRX when L3 filtering is used. This test will partly verify the TDD-TDD inter-frequency cell search in DRX requirements in clause 8.1.2.3.2.2 and the UE behaviour with the filterCoefficent defined in TS 36.331 [2].

The test parameters are given in Tables A.8.4.3.1-1, A.8.4.3.1-2, A.8.4.3.1-3 and A.8.4.3.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 1 as defined in Table 8.1.2.1-1 is provided.

The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.4.3.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.2
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2
parameters		Channel R.6 TDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Time offset between cells	μs	3	synchronous cells
Gap Pattern Id		1	As specified in TS 36.133
			clause 8.1.2.1.
Uplink-downlink configuration		1	As specified in table 4.2.2 in TS
of cells			36.211
Special subframe configuration		6	As specified in table 4.2.1 in TS
of cells			36.211
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined
			in Table A.8.4.3.1-3
T1	S	30	
T2	S	9	

Table A.8.4.3.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Cell 1		Cell 2		
		T1 T2		T1	T2	
E-UTRA RF Channel Number		1			2	
BW _{channel}	MHz	1	0	10		
OCNG Patterns defined in A.3.2.2.1 (OP.1		OP.1	TDD	OP.2	2 TDD	
TDD) and in A.3.2.2.2 (OP.2 TDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0		0		
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB				_	
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	4	24	
$N_{oc}^{ m Note 2}$	dBm/15 KHz		-(98		
\hat{E}_s/N_{oc}	dB	4	4	4	24	
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-74	
SCH_RP Note 3	dBm/15 KHz	-94	-94	-94	-74	
Propagation Condition			AW	/GN		
Note 1: OCNG shall be used such that bo	th cells are fully all	located and	a constant to	tal transmitt	ed power	
spectral density is achieved for all						

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

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

Table A.8.4.3.1-3: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	sf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.4.3.1-4: TimeAlignmentTimer -Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment	
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331	
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.	

A.8.4.3.2 **Test Requirements**

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6400 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of

time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.4.4 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

A.8.4.4.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.3.7.

The test scenario comprises of two E-UTRA TDD carriers and one cell on each carrier as given in tables A.8.4.4.1-1 and A.8.4.4.1-2. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE. Measurement gaps shall be deconfigured before the start of T3.

Table A.8.4.4.1-1: General test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
E-UTRA RF channel number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	μs	3	Synchronous cells
T1	S	5	
T2	S	≤10	
T3	S	5	

Table A.8.4.4.1-2: Cell specific test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit		Cell 1			Cell 2		
		T1	T2	Т3	T1	T2	T3	
E-UTRA RF Channel			1			2		
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2	
A.3.2.2.1 (OP.1 TDD) and		TDD	TDD	TDD	TDD	TDD	TDD	
in A.3.2.2.2 (OP.2 TDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB	0 0						
PHICH_RB	dB							
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
\hat{E}_{s}/I_{ot}	dB	4	4	4	-Infinity	7	7	
$N_{oc}^{ m Note 2}$	dBm/15 KHz			-6	98			
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7	
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91	
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91	
Propagation Condition	AWGN							
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral								

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

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

A.8.4.4.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

 $Test\ requirement = RRC\ Procedure\ delay +\ T_{identify\ CGI,inter} + reporting\ delay$

= 15 + 150 + 2ms from the start of T3

= 167 ms, allow 170 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall 42 ACK/NACK number is caused by two parts. Firstly, at least 30 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.1.2.3.7.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional 12 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

A.8.4.5 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

A.8.4.5.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.3.7. The requirement is verified in a DRX configuration.

The test scenario comprises of two E-UTRA TDD carriers and one cell on each carrier as given in tables A.8.4.5.1-1, A.8.4.5.1-2, A.8.4.5.1-3 and A.8.4.5.1-4. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE. Measurement gaps shall be deconfigured before the start of T3.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

Table A.8.4.5.1-1: General test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
E-UTRA RF channel number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.4.5.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	μs	3	Synchronous cells
T1	S	5	
T2	S	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	S	5	

Table A.8.4.5.1-2: Cell specific test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

E-UTRA RF Channel	P.2 O	10	Γ3			
Number BW _{channel} MHz 10 OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD) OP.1 OP.1 OP.1 OP.1 OP.1 OP.1 OP.1 OP.1	P.2 0	10				
BW _{channel}	P.2 O					
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD) OP.1 TDD	P.2 O					
A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA BDCCH_RB BDCCH_RA BDCCH_RA BDCCH_RA BDCCH_RB B	_					
in A.3.2.2.2 (OP.2 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA DCFICH_RB PHICH_RA DCCH_RB DCCH_RA DCCH_RA DCCH_RB DCCH_RA DCCH_RA DCCH_RA DCCH_RA DCCH_RA DCCH_RB DCCH_RA DCCH_RB DCCH_RB DCCH_RA DCCH_RB DCCH	DD T		P.2			
PBCH_RA dB PBCH_RB dB PSS_RA dB SSS_RA dB PCFICH_RB dB PHICH_RA dB PHICH_RB dB PDCCH_RA dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RA ^{Note 1} dB		DD TI	DD			
PBCH_RB dB PSS_RA dB SSS_RA dB PCFICH_RB dB PHICH_RA dB PDCCH_RB dB PDCCH_RA dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RA ^{Note 1} dB						
PSS_RA dB SSS_RA dB PCFICH_RB dB PHICH_RA dB PHICH_RB dB PDCCH_RA dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RA ^{Note 1} dB						
SSS_RA dB PCFICH_RB dB PHICH_RA dB PHICH_RB dB PDCCH_RA dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RA ^{Note 1} dB						
PCFICH_RB dB PHICH_RA dB PHICH_RB dB PDCCH_RA dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RANote 1 dB						
PHICH_RA dB 0 PHICH_RB dB PDCCH_RA dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RANote 1 dB						
PHICH_RB dB PDCCH_RA dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RANote 1 dB		_				
PDCCH_RA dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RANote 1 dB		0				
PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RANote 1 dB						
PDSCH_RA dB PDSCH_RB dB OCNG_RA ^{Note 1} dB						
PDSCH_RB dB OCNG_RA ^{Note 1} dB						
OCNG_RA ^{Note 1} dB						
OCNG_RA ^{Note 1} dB						
OCNG_RB ^{Note 1} dB						
$\hat{ extbf{E}}_{ ext{s}}/ extbf{I}_{ ext{ot}}$ dB 4 4 4 -Inf	inity	7	7			
N_{oc} Note 2 dBm/15 KHz -98		<u> </u>				
E_s/W_{oc}	inity	7	7			
RSRP Note 3 dBm/15 KHz -94 -94 -94 -Inf	inity -	·91 -9	91			
SCH_RP Note3 dBm/15 KHz -94 -94 -94 -Inf	inity -	·91 -9	91			
Propagation Condition AWGN						
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total						

- density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\it oc}$ to be fulfilled.
- RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are Note 3: not settable parameters themselves.

Table A.8.4.5.1-3: DRX configuration for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.4.5.1-4: TimeAlignmentTimer - Configuration for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.4.5.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify CGI, inter}$ + reporting delay

- = 15 + 150 + 2ms from the start of T3
- = 167 ms, allow 170 ms.

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

A.8.4.6 E-UTRAN TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0

A.8.4.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD-TDD inter-frequency cell search requirements in clause 8.1.2.3.4.

The test parameters are given in Table A.8.4.6.1-1 and A.8.4.6.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.4.1.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for TDD UL/DL configuration 0

Parameter	Unit	Value	Comment
		DL Reference Measurement	
PDSCH parameters		Channel R.5 TDD	As specified in clause A.3.1.1.2
		DL Reference Measurement	
PCFICH/PDCCH/PHICH		Channel R.6 TDD	As specified in clause A.3.1.2.2
parameters			
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
			The same configuration in both cells
Uplink-downlink configuration		0	As specified in TS 36.211 clause 4.2 Table
			4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	10	

Table A.8.4.6.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for TDD UL/DL configuration 0

Parameter	Unit	Unit Cell 1 T1 T2		Cell	2
				T1	T2
E-UTRA RF Channel			1	2	
Number					
BW _{channel}	MHz		10	10)
Correlation Matrix and		1x2	Low	1x2 L	_OW
Antenna Configuration					
OCNG Pattern defined					
n A.3.2.2 (TDD)		OP.	TDD	OP.2	TDD
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB			0	
PHICH_RA	dB		0		
PHICH_RB	dB		0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7
$N_{oc}^{ m Note~3}$	dBm/15 kHz			-98	
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7
Propagation Condition			E	TU70	

Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.4.6.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [7920] ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.4.7 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for Increased Carrier Monitoring without Reduced Performance Group

A.8.4.7.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD-TDD inter-frequency cell search requirements in clause 8.1.2.3.4.

The test parameters are given in Table A.8.4.1.1-1 and A.8.4.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cells 2, 3 or 4.

Table A.8.4.7.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
UE configured E-UTRA RF		1, 2,3,4,5,6,7,8,9	Serving cell and eight TDD carrier
Channel Number			frequencies are used in the UE neighbour cell list.
Test equipment configuration		Cell 1 uses UTRA RF channel	
		number 1	
		Cells 2,3,4 are randomly	
		selected to use different	
		frequencies selected from	
		frequencies 2,3,4,5,6,7,8,9	
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
T1	S	5	
T2	S	80	

Table A.8.4.7.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells (Cell # 1 and Cell # 2)

Parameter	Unit	Cell 1		Ce	II 2
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2,3,4,5,6,7,8 st	elected from uch that cell 2 is rformance group
BW _{channel}	MHz		N _{RB} = 25 N _{RB} = 50	5MHz: I	N _{RB,} = 25 N _{RB,} = 50
Measurement			10-15		: 10-15
bandwidth	$n_{{\scriptscriptstyle PRB}}$	10MHz	:: 22-27	10MHz	:: 22-27
PDSCH Reference		5MHz: F	R.5 TDD		-
measurement channel		10MHz:	R.0 TDD		
defined in A.3.1.1.					
PDSCH allocation	n_{PRB}		:: 7-17 :: 13-36		-
PDCCH/PCFICH/PHIC		5MHz: R	1.11 TDD	5MHz: R	R.11 TDD
H Reference		10MHz:	R.6 TDD	10MHz:	R.6 TDD
measurement channel					
defined in A.3.1.2.					
OCNG Patterns			P.15 TDD		P.16 TDD
defined in A.3.2.	-ID	10MHZ: C	DP.1 TDD	10MHz: OP.2 TDD	
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB dB	-			
PCFICH_RB PHICH_RA	dB	-			
PHICH_RB	dB	()		0
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
N_{oc} Note 3	dBm/15 kHz	-6	98	-6	98
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91
Io ^{Note 4}	dBm/ BW _{channel}	- 64.76+10log(N _{RB,c} /50)	- 64.76+10log(N _{RB,o} /50)	- 70.22+10log(N _{RB,c} /50)	- 62.43+10log(N _{RB,} /50)
Propagation Condition			J70		Ú70
Correlation Matrix and		1x2	Low		Low
Antenna Configuration					
Timing offset to cell 1	ms		-		3

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

Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.4.7.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells (Cell # 3 and Cell # 4)

Parameter	Unit	Ce	II 3	Cell 4		
		T1	T2	T1	T2	
E-UTRA RF Channel		Randomly s	elected from	Randomly s	elected from	
Number		2,3,4,5,6,7,8 s	such that cell 3	2,3,4,5,6,7,8 st	ich that cell 4 is	
		is in the norma	al performance	in the normal performance g		
		gro	oup			
BW _{channel}	MHz		√ _{RB} = 25		N _{RB,} = 25	
			$N_{RB} = 50$		$N_{RB,=} 50$	
Correlation Matrix and		1x2	Low	1x2	Low	
Antenna Configuration						
Measurement			10-15		10-15	
bandwidth	$n_{\it PRB}$	10MHz	: 22-27	10MHz	: 22-27	
PD0011D (
PDSCH Reference			-	,	-	
measurement channel						
defined in A.3.1.1.						
PDSCH allocation	$n_{{\scriptscriptstyle PRB}}$,	-	,	=	
PDCCH/PCFICH/PHIC		5MHz: R	.11 TDD	5MHz: R	.11 TDD	
H Reference		10MHz:	R.6 TDD	10MHz:	R.6 TDD	
measurement channel						
defined in A.3.1.2.						
OCNG Patterns		5MHz: OI	P.16 TDD	5MHz: Ol	P.16 TDD	
defined in A.3.2.		10MHz: 0	P.2 TDD	10MHz: OP.2 TDD		
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	()	()	
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~3}$	dBm/15 kHz	-6	98	-6	98	
\hat{E}_s/N_{oc}	dB	-Infinity	7	-Infinity	7	
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	-Infinity	7	-Infinity	7	
RSRP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91	
SCH_RP Note 4	dBm/15 kHz	-infinity	-91	-infinity	-91	
lo ^{Note 4}	dBm/ BW _{channel}	-	-		-	
-	Channel Channel	70.22+10log(62.43+10log(70.22+10log(N	62.43+10log(N	
		N _{RB,c} /50)	N _{RB,} /50)	70.22+1010g(N RB, /50)	RB,c/50)	
Propagation Condition			J70		 J70	
Correlation Matrix and						
Antenna Configuration		1x2 Low 1x2 Low				
Timing offset to cell 1	ms		3		3	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power						

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

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be

A.8.4.7.2 Test Requirements

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 61.44s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.4.8 TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX

A.8.4.8.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD-TDD inter-frequency cell measurement requirements for increased UE carrier monitoring in clause 8.1.2.3.

The test parameters are given in Tables A.8.4.8.1-1, A.8.4.8.1-2 and A.8.4.8.1-3. In this test, there are 4 cells on different carrier frequencies and gap pattern configuration #0 as defined in table A.8.4.8.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Events A3 is used. The test consists of two successive time periods for every reptitation, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of neighoubour cells. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 8 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table A.8.4.8.1-1: General test parameters for TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF		1,2,3,4,5,6,7,8,9	Serving cell and 8 TDD carrier frequencies
Channel Number			are used in the UE neighbour cell list.
			Frequencies 5,6,7,8 and 9 are indicated to
			have reduced performance
Test equipment		Cell 1 uses E-UTRA RF cannel	
configuration		number 1	
		Cell 2,3,4 are randomly selected	
		to use different frequencies	
		selected from frequencies	
		2,3,4,5,6,7,8,9	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Scaling factor configurations		8	As specified in TS 36.133 clause
			8.1.2.1.1a
T1	S	5	
T2	S	155	

Table A.8.4.8.1-2: Cell specific test parameters for TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX (Cell #1 and Cell #2)

Parameter	Unit	Ce	II 1	Cell 2, Cell 3, Cell 4		
		T1	T2	T1	T2	
E-UTRA RF Channel		,		Randomly se	lected from 2,3,4	
Number					2 is in the normal	
				perform	ance group	
BW _{channel}		5MHz: N	N _{RB} = 25	5MHz	: N _{RB.} = 25	
Glamo			$N_{RB} = 50$		z: N _{RB,} = 50	
Special subframe			110	6	1,5,	
configuration Note1						
Uplink-downlink				1		
configuration Note1						
PDSCH parameters:		5MHz: I	R.4 TDD	5MHz:	R.4 TDD	
DL Reference			R.0 TDD		z:R.0 TDD	
Measurement Channel						
As specified in						
clause A.3.1.1.2						
PCFICH/PDCCH/PHIC		5MHz· R	1.11 TDD	5MHz·	R.11 TDD	
H parameters: DL			R.6 TDD		z:R.6 TDD	
Reference		1 0.0 12				
Measurement Channel						
As specified in						
clause A.3.1.2.2						
OCNG Patterns		5MHz: O	P.9 TDD	5MHz·	OP.10.TDD	
defined in A.3.2.2.1,			P.1 TDD		:OP.2 TDD	
A.3.2.2.2 ,A.3.2.2.9		10111112.0	71.11 100	1011112	.01 .2 100	
and A.3.2.2.10						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	-)		0	
PDCCH_RA	dB	1				
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 2}	dB					
OCNG_RB ^{Note 2}	dB		20		00	
$N_{oc}^{ m Note~4}$	dBm/15 kHz	-8	98		-98	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
$\hat{E}_{_{s}}/I_{_{ot}}$ Note 5	dB	4	4	-Infinity	7	
RSRP Note 5	dBm/15 kHz	-94	-94	-Infinity	-91	
SCH RP Note 5	dBm/15 kHz	-94	-94	-Infinity	-91	
lo Note 4	dBm/Ch BW	-64.76	-64.76	-70.22	-62.43	
	3D111/011 DW	+10log	+10log	+10log	+10log	
		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	
Propagation Condition					WGN	
Antenna Configuration					1x2	
Timing offset to Cell 1		17	<u>.</u>		3 μs	
Note 1: For special su	المالمين المالمين	l danum limbra an méinn	matiana aaa Tabl			

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 3: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.

Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 5: Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Table A.8.4.8.1-3: Cell specific test parameters for TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured, non DRX (Cell #3, Cell #4)

Parameter	Unit	Cell 3		C	Cell 4		
		T1	T2	T1	T2		
E-UTRA RF Channel		Randomly s	elected from	Randomly	selected from		
Number		5,6,7,8,9 such			ch that cell 4 is in		
		the reduced			erformance group.		
			oup		annel is different		
			- 1		3 RF channel.		
BW _{channel}		5MHz: N	√ _{RB} = 25		: N _{RB,} = 25		
Granner			$N_{RB} = 50$		z: N _{RB,} = 50		
Special subframe			TKD	6	NO,		
configuration Note1							
Uplink-downlink				1			
configuration Note1							
PDSCH parameters:		5MHz: I	R.4 TDD	5MHz:	R.4 TDD		
DL Reference		10MHz:I			z:R.0 TDD		
Measurement Channel							
As specified in							
clause A.3.1.1.2							
PCFICH/PDCCH/PHIC		5MHz: R	.11 TDD	5MHz:	R.11 TDD		
H parameters: DL		10MHz:I	R.6 TDD	10MH:	z:R.6 TDD		
Reference							
Measurement Channel							
As specified in							
clause A.3.1.2.2							
OCNG Patterns		5MHz: Of	P.10.TDD	5MHz:	OP.10.TDD		
defined in A.3.2.2.2		10MHz:C	P.2 TDD	10MHz	:OP.2 TDD		
and A.3.2.2.10							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		`		0		
PHICH_RB	dB	()		0		
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 2}	dB						
OCNG_RB ^{Note 2}	dB						
$N_{oc}^{ m Note~4}$	dBm/15 kHz	-9	98		-98		
\hat{E}_s/N_{oc}	dB	-Infinity	7	-Infinity	7		
\hat{E}_{s}/I_{ot} Note 5	dB	-Infinity	7	-Infinity	7		
RSRP Note 5	dBm/15 kHz	-Infinity	-91	-Infinity	-91		
SCH RP Note 5	dBm/15 kHz	-Infinity	-91	-Infinity	-91		
lo Note 5	dBm/Ch BW	-70.22	-62.43	-70.22	-62.43		
-		+10log +10log		+10log	+10log		
		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)		
Propagation Condition		AW			WGN		
Antenna Configuration			(2	1x2			
Timing offset to Cell 1		3			3 μs		
, and the second	hframa and unlink a						

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 3: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.

Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 5: Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

A.8.4.8.2 Test Requirements

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 13.17s (cell 2) and 153.6s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

A.8.4.9 TDD-TDD Inter-frequency correct reporting of measurement events with reduced performance group configured, DRX

A.8.4.9.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in DRX. This test will partly verify the TDD-TDD inter-frequency cell search requirements when DRX is used in clause 8.1.2.3.

The test parameters are given in Tables A.8.4.9.1-1, A.8.4.9.1-2, A.8.4.9.1-3 and A.8.4.9.1-4. In this test, there are four cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

The UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle..

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2, 3 or 4. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 8 cells on different frequencies which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table A.8.4.9.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for IncMon

Parameter	Unit	Value	Comment
UE configured E-UTRA RF		1, 2,3,4,5,6,7,8,9	Serving cell and eight TDD carrier frequencies are used in
Channel Number			the UE neighbour cell list. Frequencies 5,6,7,8 and 9 are
			indicated to have reduced performance
Test equipment		Cell 1,2,3,4	Cell 1 uses E-UTRA RF channel number 1
configuration			Cells 2 are randomly selected to use different frequencies selected from E-UTRA frequencies 2, 3, 4.
			Cells 3, 4 are randomly selected to use different
			frequencies selected from E-UTRA frequencies 5, 6, 7, 8,
			9.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cells		Cell 2,3,4	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Special subframe		6	As specified in table 4.2-1 in TS 36.211. The same
configuration			configuration in both cells
Uplink-downlink		1	As specified in TS 36.211 clause 4.2 Table 4.2-2
configuration			
A3-Offset	dB	-5	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.3.9.1-3
Scaling factor for reduced		8	
performance group			
T1	S	5	
T2	S	155	

Table A.8.4.9.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for IncMon

Parameter	Unit	Се	II 1	Ce	II 2	Се	II 3	Ce	Cell 4	
		T1	T2	T1	T2	T1	T2	T1	T2	
E-UTRA RF Channel Number		1		Randomly sele	cted from 2,3,4	Randomly sele	ected from 5, 6,	Randomly sele	ected from 5, 6,	
					ell 2 is in the		hat cell 3 is in		at cell 4 is in the	
				normal perfor	mance group	the reduced	performance	reduced perfo	rmance group	
							oup			
Channel Bandwidth	MHz	5MHz: N			IRB,= 25		IRB = 25		IRB,= 25	
(BW _{channel})		10MHz: N			NRB,= 50		NRB = 50		NRB,= 50	
PDSCH parameters as		5MHz: F			R.4 TDD	5MHz: F			R.4 TDD	
specified in clause A.3.1.1.2		10MHz:			R.0 TDD		R.0 TDD		R.0 TDD	
PCFICH/PDCCH/PHICH		5MHz: R			1.11 TDD	5MHz: R			R.11 TDD	
parameters as specified in clause A.3.1.2.2		10MHz: I	עטו א.א	TOWHZ	R.6 TDD	10MHz:	עטו א.א	TUIVIHZ	R.6 TDD	
OCNG Patterns defined in		5MHz: O	D 0 TDD	EMH O	P.10 TDD	EMU O	P.10 TDD	EMU O	P.10 TDD	
A.3.2.2		10MHz: C			P.10 TDD DP.2 TDD		P.10 TDD DP.2 TDD		DP.2 TDD	
PBCH_RA	dB	TOIVII 12. C	71.11100	10101112.	JI .Z 100	10101112.	JI .Z 100	TOWN 12. C	JI .Z 100	
PBCH_RB	dB	-								
PSS_RA	dB	-								
SSS_RA	dB									
PCFICH_RB	dB	1								
PHICH_RA	dB					0		0		
PHICH_RB	dB	())					
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA ^{Note 1}	dB									
OCNG_RB ^{Note 1}	dB									
$N_{oc}^{$	dBm/15 kHz	-9	18	-98 -98		98	-9	98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	-Infinity	4	-Infinity	4	
$\hat{E}_{_{s}}/I_{_{ot}}$ Note 4	dB	4	4	-Infinity	4	-Infinity	4	-Infinity	4	
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	-Infinity	-94	-Infinity	-94	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	-Infinity	-94	-Infinity	-94	
lo Note 4	dBm/Ch BW	-64.76+10log	-64.76+10log	-70.22+10log	-64.76+10log	-70.22+10log	-64.76+10log	-70.22+10log	-64.76+10log	
		(N _{RB,c} /50)								
Propagation Condition		AW			'GN		'GN		/GN	
Antenna Configuration		1>	(2		x2		x2		x2	
Time offset to cell1	μS	-	·	;	3		3	;	3	

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 4: E_s/I_{ot}, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.4.9.1-3: drx-Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used for IncMon

Field	Value	Comment		
onDurationTimer	psf1			
drx-InactivityTimer	psf1			
drx-RetransmissionTimer	psf1			
longDRX-CycleStartOffset	sf160			
shortDRX	disable			
Note: For further information see clause 6.3.2 in TS 36.331.				

Table A.8.4.9.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used for IncMon

Field	Value	Comment
TimeAlignmentTimer	sf500	For further information see clause 6.3.2 in TS 36.331.
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213

A.8.4.9.2 Test Requirements

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 13.2s (cell 2) and 153.6s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

Where:

When DRX cycle is 160ms, the delay requirement of cell identification and measurement period are specified in section 8.1.2.3.1.2 and Non DRX Requirements in clause 8.1.2.3.1.1 are applicable.

The requirement of inter frequency cell identification delay are specified as

$$\mathbf{T}_{\text{Identify_Inter}} = \mathbf{T}_{\text{Basic_Identify_Inter}} \cdot \frac{480}{\mathbf{T}_{\text{Inter1}}} \cdot N_{\textit{freq},n} \cdot K_{\textit{n}} \quad \textit{ms} \, (\text{normal performance}) \, \text{and} \, \frac{1}{2} \left(\frac{1}{2} \sum_{i=1}^{n} \frac{1}{2} \sum_{i=1}^$$

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter}1}} \cdot N_{\textit{freq},r} \cdot K_r \quad \textit{ms} \, (\text{reduced performance})$$

 $T_{Basic_Identify_inter}$ 480ms, See section 8.1.2.3.1.1

 T_{Inter1} 60ms, See section 8.1.2.1

 $N_{freq,n}$ and $N_{freq,r}$ 3 and 5 set in this test case.

 K_n and K_r 8/7 and 8, See section 8.1.2.1.1a.

This gives 13165.7ms for cells 2 on normal carrier, and 153600ms for cell 3 and cell 4 on reduced carriers for Event A3 triggered measurement reporting delay. The test requirements allow 13.2s and 153.6s.

A.8.5 E-UTRAN FDD - UTRAN FDD Measurements

A.8.5.1 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

A.8.5.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN FDD- UTRAN FDD cell search requirements in clause 8.1.2.4.1.

The test parameters are given in Tables A.8.5.1.1-1, A.8.5.1.1-2 and A.8.5.1.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.5.1.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	S	5	
T2	S	6	

Table A.8.5.1.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell	1			
		T1	T2			
E-UTRA RF Channel Number		1				
BW _{channel}	MHz	10				
Correlation Matrix and		1x2 Lo	ow			
Antenna Configuration						
OCNG Pattern defined in						
A.3.2.1.1 (OP.1 FDD)		OP.1 F	DD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4			
\hat{E}_s/N_{oc}	dB	4	4			
N_{oc}	dBm/15 kHz	-98				
RSRP	dBm/15 kHz	-94	-94			
SCH_RP	dBm/15 kHz	-94 -94				
Propagation Condition		ETU7	70			

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.5.1.1-3: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 2			
		T1	T2		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.94	1		
\hat{I}_{or}/I_{oc}	dB	-Infinity	-1.8		
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/lo	dB	-Infinity -14			
Propagation Condition		Case 5 (Note 3)			

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal

to lor.

Note 3: Case 5 propagation conditions are defined in Annex A of TS 25.101.

A.8.5.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions

A.8.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN FDD - UTRAN FDD cell search requirements for identification of a new UTRA FDD cell for SON given in clause 8.1.2.4.7.1.

The test parameters are given in Tables A.8.5.2.1-1, A.8.5.2.1-2 and A.8.5.2.1-3 below. In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. Prior to the start of time period T1, an interRAT periodic measurement reporting configuration with purpose reportStrongestCellsForSON is configured, and linked to a UTRA measurement object corresponding to channel UARFCN 1. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.5.2.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/lo	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	S	>5	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	S	6	

Table A.8.5.2.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Ce	II 1
		T1	T2
E-UTRA RF Channel Number			1
BW _{channel}	MHz	1	0
OCNG Pattern defined in			
A.3.2.1.1 (OP.1 FDD)		OP.1	FDD
PBCH_RA	dB		
PBCH_RB	dB]	
PSS_RA	dB		
SSS_RA	dB]	
PCFICH_RB	dB		
PHICH_RA	dB		_
PHICH_RB	dB		0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98	
\hat{E}_s/N_{oc}	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used	such that both c	ells are fully allocated and a cou	nstant total transmitted now

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.5.2.1-3: Cell specific test parameters for UTRAN FDD (cell # 2) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 2			
		T1	T2		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.94	1		
\hat{I}_{or}/I_{oc}	dB	-Infinity	-3.35		
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/lo	dB	-Infinity -15			
Propagation Condition		AWGN			

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to $I_{\rm or}$.

A.8.5.2.2 Test Requirements

The UE shall send the first measurement report containing the primary scrambling code of cell 2, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.5.3 E-UTRAN FDD-UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

A.8.5.3.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN FDD-UTRAN FDD cell search requirements when DRX is used in clause 8.1.2.4.1.2.

In these tests, there are two cells, one E-UTRAN cell and one UTRAN cell, and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

The common test parameters are given in Table A.8.5.3.1-1. Cell specific test parameters are given in Table A.8.5.3.1-2 for E-UTRAN and in Table A.8.5.3.1-5 for UTRAN. DRX configuration for Test1 and Test2 are given in Table A.8.5.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.5.2.1-4.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.5.3.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-		DL Reference Measurement		As specified in clause A.3.1.1.1 Note that
UTRAN FDD)		Channel R.0 FDD)	UE may only be allocated at On Duration
PCFICH/PDCCH/PHICH		DL Reference Me	easurement	As specified in clause A.3.1.2.1.
parameters (E-UTRAN FDD)		Channel R.6 FDD)	
Gap Pattern Id		0		As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number
				1.
Neighbour cell		Cell 2		Cell 2 is on UTRA RF channel number 1.
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel		·	[One E-UTRA FDD carrier frequency is
Number				used.
E-UTRA Channel Bandwidth	MHz	1	0	
(BW _{channel})				
UTRA RF Channel Number		1		One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH	ł Ec/lo	
measurement quantity				
b1-Threshold-UTRA	dB	-18		CPICH Ec/lo threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	S	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access
				procedure.
DRX		ON		DRX related parameters are defined in
				Table A.8.5.3.1-3
Monitored UTRA FDD cell		12		UTRA cells on UTRA RF channel 1
list size				provided in the cell list.
T1	S	5		
T2	S	6	30	

Table A.8.5.3.1-2: Cell specific test parameters for E-UTRAN FDD (cell #1) event triggered reporting of UTRAN FDD cell when DRX is used under fading propagation conditions

Parameter	Unit	Cell 1			
		T1 T2			
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
Correlation Matrix and		1x2 Low			
Antenna Configuration					
OCNG Pattern defined in					
A.3.2.1.1 (OP.1 FDD)		OP.1 FDD			
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	_			
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB	1			
PDSCH_RA	dB	1			
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4 4			
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94 -94			
SCH_RP	dBm/15 kHz	-94 -94			
\hat{E}_s/N_{oc}	dB	4 4			
Propagation Condition		ETU70			
Note 1: OCNG shall be used	such that both ce	ells are fully allocated and a constant total transmitted nower			

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

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

Table A.8.5.3.1-3: drx-Configuration to be used in E-UTRAN FDD-UTRAN FDD event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment	
Field	Value	Value		
onDurationTimer	psf1	psf1		
drx-InactivityTimer	psf1	psf1		
drx-RetransmissionTimer	psf1	psf1		
longDRX-CycleStartOffset	sf40	sf1280		
shortDRX	Disable	Disable		
Note: For further information see clause 6.3.2 in TS 36.331.				

Table A.8.5.3.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN FDD-UTRAN FDD event triggered reporting when DRX is used in fading propagation conditions

Field	Test1 Value	Test2 Value	Comment
TimeAlignmentTimer	sf500	sf500	For further information see clause 6.3.2 in TS 36.331.
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

Table A.8.5.3.1-5: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell when DRX is used under fading propagation conditions

Parameter	Unit	Cell	2		
		T1	T2		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.94	1		
\hat{I}_{or}/I_{oc}	dB	-Infinity	-1.8		
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/lo	dB	-Infinity -14			
Propagation Condition		Case 5 (Note 3)			

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal

to l_{or}.

Note 3: Case 5 propagation conditions are defined in Annex A of TS 25.101.

A.8.5.3.2 Test Requirements

In Test1 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 2400 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE sends the measurement report on PUSCH.

In Test2 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 20*1280ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report.

A.8.5.4 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

A.8.5.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN cells. This test will partly verify the Enhanced UTRA FDD cell identification requirements in clause 8.1.2.4.1.1.1a.

The test parameters are given in Tables A.8.5.4.1-1, A.8.5.4.1-2 and A.8.5.4.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time period T1, gaps are activated and an interRAT measurement reporting configuration is configured, and linked to a UTRA measurement object corresponding to channel UARFCN 1. Prior to time duration T2, the UE shall not have any timing information of cell 2. Cell 2 is powered up at the beginning of the T2

Table A.8.5.4.1-1: General test parameters for E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list
T1	S	5	
T2	S	2	

Table A.8.5.4.1-2: Cell specific test parameters for cell #1 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell	1	
		T1	T2	
E-UTRA RF Channel Number		1		
BW _{channel}	MHz	10		
OCNG Pattern defined in				
A.3.2.1.1 (OP.1 FDD)		OP.1 F	DD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	0		
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
\hat{E}_{s}/I_{ot}	dB	4	4	
$N_{oc}^{$	dBm/15 kHz	-98		
\hat{E}_s/N_{oc}	dB	4 4		
RSRP Note 4	dBm/15 kHz	-94	-94	
SCH_RP	dBm/15 kHz	-94 -94		
Propagation Condition		AWG	SN	

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\rm ec}$ to be

ulfilled.

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.5.4.1-3: Cell specific test parameters for cell #2 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell	2	
		T1	T2	
UTRA RF Channel Number		1		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DPCH_Ec/lor	dB	N/A		
OCNS		-0.941		
\hat{I}_{or}/I_{oc}	dB	- 00	0.02	
I_{oc}	dBm/3.84 MHz	-70		
CPICH_Ec/Io ^{Note 3}	dB	-∞ -13		
Propagation Condition		AWGN		

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal

to I_{or}.

Note 3: This gives an SCH Ec/lo of -15dB

A.8.5.4.2 Test Requirements

The UE shall send the first measurement report containing the primary scrambling code of cell 2, with a measurement reporting delay less than 960 ms from the beginning of time period T2. The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH

A.8.5.5 E- UTRAN FDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps

A.8.5.5.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of UTRA cell with autonomous gaps in clause 8.1.2.4.17.

The test parameters are given in Tables A.8.5.5.1-1, A.8.5.5.1-2 and A.8.5.5.1-3 below. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event B1. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

Table A.8.5.5.1-1: General test parameters for E-UTRAN FDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement	As specified in clause A.3.1.1.1.
		Channel R.0 FDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1.
(E-UTRAN FDD)		Channel R.6 FDD	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
SIB3_REP	Frames	32	Applicable for cell 2 SIB3 scheduling
SIB3 SEG_COUNT		1	Applicable for cell 2 SIB3 scheduling
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided
			in the cell list.
CSG id (of cell 2)		Set to any non-empty value	
T1	S	5	
T2	S	≤10	
T3	s	5	

Table A.8.5.5.1-2: Cell specific test parameters for cell #1 E-UTRAN FDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
BW _{channel}	MHz	10	
OCNG Pattern defined in			
A.3.2.1.1 (OP.1 FDD)		OP.1 FD	D
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4
$N_{oc}^{ m Note~3}$	dBm/15 kHz	-98	
\hat{E}_s/N_{oc}	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	1

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.5.5.1-3: Cell specific test parameters for cell #2 E-UTRAN FDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps

Parameter Unit		Cell	2	
		T1	T2	
UTRA RF Channel Number		1		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DPCH_Ec/lor	dB	N/A		
OCNS		-0.941		
\hat{I}_{or}/I_{oc}	dB	-∞	0.02	
I_{oc}	dBm/3.84 MHz	-70		
CPICH_Ec/Io ^{Note 3}	dB	-∞ -13		
Propagation Condition		AWGN		

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or} .

Note 3: This gives an SCH Ec/lo of -15dB

A.8.5.5.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within [1965] milliseconds from the start of T3.

Test requirement = RRC Procedure delay + Tidentify_CGI, UTRAN FDD + reporting delay

- = 50 + [630] + 40*32 + 2ms from the start of T3
- = [1962] ms, allow [1965] ms.

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

A.8.5.6 E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

A.8.5.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event without measurement gaps. This test will partly verify the E-UTRAN FDD- UTRAN FDD cell search requirements in clause 8.1.2.4.1.

The test parameters are given in Tables A.8.5.6.1-1, A.8.5.6.1-2 and A.8.5.6.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. PDCCH on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

Table A.8.5.6.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement	As specified in clause A.3.1.1.1.
		Channel R.3 FDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1.
(E-UTRAN FDD)		Channel R.6 FDD	
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement		CPICH Ec/lo	
quantity			
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided
			in the cell list.
T1	S	5	
T2	S	6	

Table A.8.5.6.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of UTRAN FDD cell without measurement gaps under AWGN propagation conditions

Parameter	Unit	Cel	Cell 1	
		T1	T2	
E-UTRA RF Channel Number		1		
BW _{channel}	MHz	1()	
OCNG Pattern defined in				
A.3.2.1.10 (OP.10 FDD)		OP.10	FDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	0		
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	
\hat{E}_s/N_{oc}	dB	4	4	
N_{oc}	dBm/15 kHz	-98	8	
RSRP	dBm/15 kHz	-94	-94	
SCH_RP	dBm/15 kHz	-94	-94	
Propagation Condition		AWO	GN	

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.5.6.1-3: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell without measurement gaps under AWGN propagation conditions

Parameter	Unit	Cell 2				
		T1	T2			
UTRA RF Channel Number		1				
CPICH_Ec/lor	dB	-10				
PCCPCH_Ec/lor	dB	-12				
SCH_Ec/lor	dB	-12				
PICH_Ec/lor	dB	-15				
DPCH_Ec/lor	dB	N/A				
OCNS		-0.941				
\hat{I}_{or}/I_{oc}	dB	-Infinity	-1.8			
I_{oc}	dBm/3.84 MHz	-70				
CPICH_Ec/lo	dB	-Infinity	-14			
Propagation Condition		AWGN				

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}

A.8.5.6.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall send continuous ACK/NACK throughout the test, and from the start of T2 until Event B1 is reported, at least 85% ACK/NACK shall be detected.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously. The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.5.7 E-UTRAN FDD - UTRAN FDD Event Triggered Reporting under Fading Propagation Conditions for 5 MHz Bandwidth

A.8.5.7.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN FDD- UTRAN FDD cell search requirements in clause 8.1.2.4.1.

The parameters of this test are the same as defined in Section A.8.5.1.1 except that the values of the parameters in the Table A.8.5.7.1-1 will replace the values of the corresponding parameters in A.8.5.1.1-1, and the values of the parameters in the Table A.8.5.7.1-2 will replace the values of the corresponding parameters in A.8.5.1.1-2.

Table A.8.5.7.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment			
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement	As specified in clause A.3.1.1.1.			
		Channel R.5 FDD				
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1.			
(E-UTRAN FDD)		Channel R.11 FDD				
E-UTRA Channel Bandwidth	MHz	5				
(BW _{channel})						
NOTE 1: See Table A.8.5.1.1-1 for the other parameters.						
NOTE 2: This test is according to the principle defined in Section A 3.7.2						

Table A.8.5.7.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of **UTRAN FDD cell under fading propagation conditions**

Parameter	Unit	Cell 1			
		T1	T2		
BW _{channel}	MHz	5			
OCNG Pattern defined in		OP.15 FDD			
A.3.2.1.15					
NOTE: See Table A.8.1.3.1-2 for the other parameters.					

A.8.5.7.2 **Test Requirements**

The test requirements defined in Section A.8.5.1 shall apply to this test case.

E-UTRA FDD InterRAT UTRA FDD correct reporting of measurement A.8.5.8 events with reduced performance group configured, non DRX

A.8.5.8.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRA FDD-UTRA FDD inter-RAT cell search requirements in clause 8.1.2.4.1.

The test parameters are given in Tables A.8.5.8.1-1 and A.8.5.8.1-2. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2, 3 or 4. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 8 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table A.8.5.8.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF		1	Serving cell and six UTRA FDD carrier
Channel Number			frequencies are used in the UE neighbour
	ļ		cell list. Frequencies 5,6 and 7 are indicated to have reduced performance
UE is configured UTRA RF		2, 3, 4, 5, 6, 7	indicated to have reduced performance
channel numbers	ļ	2, 3, 4, 5, 6, 7	
Test equipment		Cell 1 uses E-UTRA RF channel	Cells 2, 3 and 4 are chosen randomly,
configuration	ļ	number 1	such that one frequency belongs to the
- comgaration		Cells 2,3,4 are randomly selected	normal performance group and two
	ļ	to use different frequencies	frequencies belong to the reduced
	ļ	selected from UTRA RF channel	performance group
		numbers 2,3,4,5,6,7	
PDSCH parameters (E-		DL Reference Measurement	As specified in clause A.3.1.1.1.
UTRAN FDD)		Channel R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1.
parameters		Channel R.6 FDD	
(E-UTRAN FDD)			
Correlation Matrix and		1x2 low	
Antenna Configuration			
Active cell		Cell 1	Cell 1 is on RF channel number 1
Time offset with respect to cell1	ļ	0	
Gap Pattern Id	 	0	As specified in TS 36.133 clause 8.1.2.1.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	7.6 6 position in 10 do: 100 diageo 0:1.2:1.
measurement quantity	ļ	31 1311 23/13	
b1-Threshold-UTRA	dB	-18	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Scaling factor for reduced		16	
performance group			
T1	S	5	
T2	S	155	

Table A.8.5.8.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	5MHz: N 10MHz: I	N _{RB} = 25 N _{RB} = 50		
Correlation Matrix and			Low		
Antenna Configuration					
OCNG Pattern defined in					
A.3.2.1.1 (OP.1 FDD)		OP.1	FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	()		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4		
\hat{E}_s/N_{oc}	dB	4	4		
N_{oc}	dBm/15 kHz	-9	98		
RSRP	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		ETU	J70		

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.5.8.1-3: Cell specific test parameters for UTRAN FDD (cell # 2, 3 and 4) for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Cell 2		Cell 3		Cell 4		
		T1	T2	T1	T2	T1	T2	
		Cells	2 is	Cells 3 is		Cells 4 is		
		rand	omly	randomly		randomly		
		selected to use different		selected to		selected to		
				use different		use different		
UTRA RF Channel Number		frequencies		frequencies		frequencies		
OTTA IN Chamile Number		selecte		selected from		selecte	-	
		UTR		UTRA RF		UTRA RF		
		chai			nnel	chai		
		num		numbers		numbers		
		2,3,4,5,6,7 2,3,4,5,6,7 2,				2,3,4	2,3,4,5,6,7	
CPICH_Ec/lor	dB				0			
PCCPCH_Ec/lor	dB	-12						
SCH_Ec/lor	dB	-12						
PICH_Ec/lor	dB			-1	5			
DPCH_Ec/lor	dB			N,	/A			
OCNS				-0.9	941			
		-	-1.8	-	-1.8	-	-1.8	
\hat{I}_{or}/I_{oc}	dB	infinit		infinit		infinit		
		у		у		у		
I_{oc}	dBm/3.84							
¹oc	MHz							
		-	-14	-	-14	-	-14	
CPICH_Ec/lo	dB	infinit		infinit		infinit		
		у		у		у		
Propagation Conditions		Case 5 (Note 3)						
Notes TBD								

A.8.5.8.2 Test Requirements

The UE shall send Event B1 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 7.68s (cell 2) and 115,2s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

A.8.6 E-UTRAN TDD - UTRAN FDD Measurements

A.8.6.1 E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

A.8.6.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN TDD- UTRAN FDD cell search requirements in clause 8.1.2.4.2.

The test parameters are given in Tables A.8.6.1.1-1, A.8.6.1.1-2 and A.8.6.1.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.6.1.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2.
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. Applicable to cell 1.
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. Applicable to cell 1.
CP length		Normal	Applicable to cell 1.
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	S	6	

Table A.8.6.1.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell	11
		T1	T2
E-UTRA RF Channel Number		1	
BW _{channel}	MHz	10)
Correlation Matrix and		1x2 L	_OW
Antenna Configuration			
OCNG Pattern defined in			
A.3.2.2.1 (OP.1 TDD)		OP.1	TDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
\hat{E}_{s}/I_{ot}	dB	4	4
\hat{E}_s/N_{oc}	dB	4	4
N_{oc}	dBm/15 kHz	-98	8
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		ETU	70

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.6.1.1-3: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 2			
		T1	T2		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.94	1		
\hat{I}_{or}/I_{oc}	dB	-Infinity	-1.8		
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/lo	dB	-Infinity	-14		
Propagation Condition		Case 5 (N	ote 3)		

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal

to I_{or}.

Note 3: Case 5 propagation conditions are defined in Annex A of TS 25.101.

A.8.6.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.6.2 E- UTRAN TDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps

A.8.6.2.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of UTRA cell with autonomous gaps in clause 8.1.2.4.18.

The test parameters are given in Tables A.8.6.2.1-1, A.8.6.2.1-2 and A.8.6.2.1-3 below. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event B1. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

Table A.8.6.2.1-1: General test parameters for E-UTRAN TDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement	As specified in clause A.3.1.1.2.
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.2.
(E-UTRAN TDD)		Channel R.6 TDD	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
			Applicable to cell 1.
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211.
			Applicable to cell 1.
CP length		Normal	Applicable to cell 1.
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
SIB3_REP	Frames	32	Applicable for cell 2 SIB3 scheduling.
SIB3 SEG_COUNT		1	Applicable for cell 2 SIB3 scheduling.
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided
			in the cell list.
CSG id (of cell 2)		Set to any non-empty value	
T1	S	5	
T2	S	≤10	
T3	s	5	

Table A.8.6.2.1-2: Cell specific test parameters for cell #1 E-UTRAN TDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
BW _{channel}	MHz	10	
OCNG Pattern defined in			
A.3.2.2.1 (OP.1 TDD)		OP.1 TD	D
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4
$N_{oc}^{ m Note~3}$	dBm/15 kHz	-98	
\hat{E}_s/N_{oc}	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWĠN	

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.6.2.1-3: Cell specific test parameters for cell #2 E-UTRAN TDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps

Parameter	Unit	Cell 2				
		T1	T2			
UTRA RF Channel Number		1				
CPICH_Ec/lor	dB	-10				
PCCPCH_Ec/lor	dB	-12				
SCH_Ec/lor	dB	-12				
PICH_Ec/lor	dB	-15				
DPCH_Ec/lor	dB	N/A				
OCNS		-0.94	1			
\hat{I}_{or}/I_{oc}	dB	-∞	0.02			
I_{oc}	dBm/3.84 MHz	-70				
CPICH_Ec/Io ^{Note 3}	dB	-∞	-13			
Propagation Condition		AWGN				

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or} .

Note 3: This gives an SCH Ec/lo of -15dB

A.8.6.2.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within [1965] milliseconds from the start of T3.

Test requirement = RRC Procedure delay + Tidentify_CGI, UTRAN FDD + reporting delay

- = 50 + [630] + 40*32 + 2ms from the start of T3
- = [1962] ms, allow [1965] ms.

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

A.8.6.3 E-UTRA TDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX

A.8.6.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRA TDD-UTRA FDD inter-RAT cell search requirements in clause 8.1.2.4.2.

The test parameters are given in Tables A.8.6.3.1-1 and A.8.6.3.1-2. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2, 3 or 4. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 8 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table A.8.6.3.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-UTRA RF		1	Serving cell and seven UTRA FDD carrier
Channel Number			frequencies are used in the UE neighbour
			cell list. Frequencies 5,6 and 7 are indicated to have reduced performance
UE is configured UTRA RF		2, 3, 4, 5, 6, 7,8	indicated to have reduced performance
channel numbers		2, 3, 4, 3, 6, 7,6	
Test equipment		Cell 1 uses E-UTRA RF channel	Cells 2, 3 and 4 are chosen randomly,
configuration		number 1	such that one frequency belongs to the
Comigaration		Cells 2,3,4 are randomly selected	normal performance group and two
		to use different frequencies	frequencies belong to the reduced
		selected from UTRA RF channel	performance group
		numbers 2,3,4,5,6,7,8	
PDSCH parameters (E-		DL Reference Measurement	As specified in clause A.3.1.1.2.
UTRAN TDD)		Channel R.0 TDD	·
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2
parameters		Channel R.6 TDD	
(E-UTRAN TDD)			
Correlation Matrix and		1x2 low	
Antenna Configuration			
Special subframe		6	As specified in table 4.2-1 in TS 36.211.
configuration			Applicable to cell 1
Uplink-downlink		1	As specified in table 4.2-2 in TS 36.211.
configuration			Applicable to cell 1
Active cell		Cell 1	Cell 1 is on RF channel number 1
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo threshold for event B1
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Scaling factor for reduced		16	
performance group			
T1	S	5	
T2	S	155	

Table A.8.6.3.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Cell 1		
		T1	T2	
E-UTRA RF Channel Number		1		
BW _{channel}	MHz	10		
Correlation Matrix and		1x2 L	.ow	
Antenna Configuration				
OCNG Pattern defined in				
A.3.2.1.1 (OP.1 FDD)		OP.1 I	-DD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	0		
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
\hat{E}_{s}/I_{ot}	dB	4	4	
\hat{E}_s/N_{oc}	dB	4	4	
N _{oc}	dBm/15 kHz	-98	3	
RSRP	dBm/15 kHz	-94	-94	
SCH_RP	dBm/15 kHz	-94	-94	
Propagation Condition		ETU	70	

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.6.3.1-3: Cell specific test parameters for UTRAN FDD (cell # 2, 3 and 4) for correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Cell 2		Cell 3		Cell 4	
		T1	T2	T1	T2	T1	T2
		Cells	2 is	Cells	3 is	Cells	4 is
		randomly		rand	omly	rand	omly
		selec	ted to	selec	ted to	select	ted to
		use di	fferent	use di	fferent	use di	fferent
UTRA RF Channel Number			encies	freque		freque	
		selecte		selecte		selecte	
		UTR		UTR		UTR	
			nnel		nnel	chai	
		num		num		numbers	
		2,3,4	5,6,7	2,3,4		2,3,4	5,6,7
CPICH_Ec/lor	dB				0		
PCCPCH_Ec/lor	dB				2		
SCH_Ec/lor	dB				2		
PICH_Ec/lor	dB			-1	-		
DPCH_Ec/lor	dB			N.			
OCNS				-0.9			
^ /		-	-1.8	-	-1.8	-	-1.8
\hat{I}_{or}/I_{oc}	dB	infinit		infinit		infinit	
		у		у		у	
I_{oc}	dBm/3.84	-70					
- oc	MHz						
			-14	- 	-14		-14
CPICH_Ec/Io	dB	infinit		infinit		infinit	
		У		У		у	
Propagation Conditions		Case 5 (Note 3)					
Notes TBD							

A.8.6.3.2 Test Requirements

The UE shall send Event B1 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 7.68s (cell 2) and 115,2s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

A.8.7 E-UTRAN TDD – UTRAN TDD Measurements

A.8.7.1 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions

A.8.7.1.1 Test Purpose and Environment

A.8.7.1.1.1 Void

A.8.7.1.1.2 1.28 Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRA TDD to UTRA TDD cell search requirements in clause 8.1.2.4.3 under fading propagation conditions.

This test scenario comprised of 1 E-UTRA TDD PCell, and 1 UTRA TDD cell to be searched. Test parameters are given in Table A.8.7.1.1.2-1, A.8.7.1.1.2-2, and A.8.7.1.1.2-3. Gap pattern configuration #0 as defined in table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.7.1.1.2-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in
		Channel R.0 TDD	clause A.3.1.1.2
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in
parameters		Channel R.6 TDD	clause A.3.1.2.2
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Gap Pattern Id		0	As specified in TS 36.133
			clause 8.1.2.1.
Uplink-downlink configuration of		1	As specified in table 4.2.2 in
cell 1			TS 36.211
Special subframe configuration of		6	As specified in table 4.2.1 in
cell 1			TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	-
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	S	5	
T2	S	10	

Table A.8.7.1.1.2-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Ce	II 1
		T1	T2
E-UTRA RF Channel			1
Number			
BW _{channel}	MHz	1	0
Correlation Matrix and		1x2	Low
Antenna Configuration			
OCNG Pattern defined in		OP 1	TDD
A.3.2.2.1 (OP.1 TDD)		01.1	100
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note1}	dB		
OCNG_RB ^{Note1}	dB		
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	9	9
\hat{E}_s/N_{oc}	dB	9	9
N_{oc}	dBm/15kHz	-(98
RSRP	dBm/15kHz	-89	-89
SCH_RP	dBm/15kHz	-89	-89
Propagation Condition		ETI	J70

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.7.1.1.2-3: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)				
Timeslot Number		C)	Dwl	PTS	
		T1	T2	T1	T2	
UTRA RF Channel Number NOTE1		Channel 2				
PCCPCH_Ec/lor	dB	-3	-3			
DwPCH_Ec/lor	dB			0	0	
OCNS_Ec/lor ^{NOTE2}	dB	-3	-3			
\hat{I}_{or}/I_{oc}	dB	-inf	5	-inf	5	
I_{oc}	dBm/1.28 MHz	-80				
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.	
Propagation Condition		Case 3 ^{NOTE3}				

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.

Note 3: Case 3 propagation conditions are defined in Annex B of TS 25.102

A.8.7.1.1.3 Void

A.8.7.1.2 Test Requirements

A.8.7.1.2.1 Void

A.8.7.1.2.2 1.28 Mcps TDD option

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 6400 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.7.1.2.3 Void

A.8.7.2 E-UTRAN TDD-UTRAN TDD cell search when DRX is used under fading propagation conditions

A.8.7.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN TDD to UTRAN TDD inter-RAT cell search requirements when DRX is used in clause 8.1.2.4.3.2 under fading propagation conditions.

The common test parameters are given in Tables A.8.7.2.1-1, A.8.7.2.1-2 and A.8.7.2.1-3. DRX configuration for Test1 and Test2 are given in Table A.8.7.2.1-4 and time alignment timer and scheduling request related parameters in Table A.8.7.2.1-5. In these tests, there are two cells, 1 E-UTRAN TDD PCell and 1 UTRAN TDD cell to be searched, Gap pattern configuration # 0 as defined in table 8.1.2.1-1 is provided.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignmend. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.7.2.1-1: General test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Va	lue	

	1	1	
PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.2. Note that
		Channel R.0 TDD	UE may only be allocated at On Duration
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2.
parameters		Channel R.6 TDD	
Active cell		Cell 1	E-UTRAN TDD cell
Neighbour cell		Cell 2	UTRAN 1.28Mcps TDD cell
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Uplink-downlink		1	As specified in TS 36.211 clause 4.2 Table
configuration			4.2-2
Special subframe		6	As specified in table 4.2-1 in TS 36.211.
configuration			The same configuration in both cells
PRACH configuration		4	As specified in table 5.7.1-3 in TS 36.211
CP length of cell 1		Normal	
Ofn	dB	0	
Thresh	dBm	-83	Absolute P-CCPCH RSCP threshold for
			event B1
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
Access Barring Information	-	Not Sent	No additional delays in random access
			procedure.
DRX		ON	DRX related parameters are defined in
			Table A.8.4.2.1-3
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	8 30	

Table A.8.7.2.1-2: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions(cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel		,	1
Number			
BWchannel	MHz	1	0
Correlation Matrix and		1x2	Low
Antenna Configuration			
OCNG Patterns defined		OP.1	TDD
in A.3.2.2.1 (OP.1 TDD)			
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RANote1	dB		
OCNG_RBNote1	dB		
\hat{E}_s/I_{ot}	dB	4	4
\hat{E}_s/N_{oc}	dB	4	4
N _{oc} Note 2	dBm/15kHz	-9	98
I RSRP	dBm/15kHz	-94	-94
SCH_RP Note 3	dBm/15kHz	-94	-94
Propagation Condition		ETI	J70

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

for N_{oc} to be fulfilled.

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

Table A.8.7.2.1-3: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions(cell 2)

rameter	Unit	nit Cell 2 (UTRA)			
Number		()	Dwl	PTS
		T1	T2	T1	T2
Channel NOTE1		Channel 2			
_Ec/lor	dB	-3	-3		
Ec/lor	dB			0	0
c/lor ^{NOTE2}	dB	-3	-3		
	dB	-inf	9	-inf	9
	dBm/1.28 MHz	-80			
RSCP	dBm	-inf	-74	n.a.	n.a.
ion		Case 3 ^{NOTE3}			
Number is the The power of total power fr Case 3 propa	e primary frequent the OCNS cha om the cell to b	ency's cha nnel that is e equal to	nnel numl s added sl lor.	ber. hall make	e the
	Channel NOTE1 _Ec/lor Ec/lor c/lor NOTE2 RSCP ion In the case o Number is the The power of total power fr	Channel NOTE1 Ec/lor dB Ec/lor dB C/lorNOTE2 dB dB dBm/1.28 MHz RSCP dBm In the case of multi-frequence Number is the primary frequence The power of the OCNS chatotal power from the cell to b Case 3 propagation condition	Number Channel NOTE1 Ec/lor Bc/lor B	Number 0 Channel Channel Channel Channel Ec/lor dB -3 -3 -3 Ec/lor dB -3 -3 -3 Ec/lor dB -inf 9 dBm/1.28	Number 0 Dwl T1 T2 T1 Channel Channel 2 Ec/lor dB -3 -3 Ec/lor dB -3 -3 C/lor NOTE2 dB -3 -3 dB -inf 9 -inf dBm/1.28

Table A.8.7.2.1-4: drx-Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
Field	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.8.7.2.1-5: TimeAlignmentTimer and sr-ConfigIndex -Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
rieid	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see clause 6.3.2 in TS 36.331.
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and 10.1 in TS 36.213.

A.8.7.2.2 Test Requirements

In Test1 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 6400ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 25.6s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

A.8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting in AWGN propagation conditions

A.8.7.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN TDD cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN TDD - UTRAN TDD cell search requirements for identification of a new UTRA TDD cell for SON given in clause 8.1.2.4.13.

In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. Prior to the start of time period T1, an interRAT periodic measurement reporting configuration with purpose reportStrongestCellsForSON is configured, and linked to a UTRA measurement object corresponding to channel UARFCN 1. During time duration T1, the UE shall not have any timing information of cell 2.

A.8.7.3.2 Test Parameters

The test parameters are given in Tables A.8.7.3.1-1, A.8.7.3.1-2 and A.8.7.3.1-3.

Table A.8.7.3.1-1: General test parameters for E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement	As specified in clause A.3.1.1.2
		Channel R.0 TDD	·
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.2
(E-UTRAN TDD)		Channel R.6 TDD	
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
Uplink-downlink configuration of cell		1	As specified in table 4.2.2 in TS 36.211
1			
Special subframe configuration of cell		6	As specified in table 4.2.1 in TS 36.211
1			
Inter-RAT (UTRA TDD)		P-CCPCH RSCP	
measurement quantity			
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		None	No explicit neighbour list is provided to the UE
T1	S	>5	During T1, cell 2 shall be powered off, and
			during the off time the primary scrambling
			code shall be changed, The intention is to
			ensure that cell 2 has not been detected by
			the UE prior to the start of period T2.
T2	S	14	

Table A.8.7.3.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Ce	II 1
		T1	T2
E-UTRA RF Channel Number			1
BW _{channel}	MHz	1	0
OCNG Patterns defined in		OP 1	TDD
A.3.2.2.1 (OP.1 TDD)		OF.1	טטו
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB	_	
PHICH_RA	dB		•
PHICH_RB	dB		0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
\hat{E}_{s}/I_{ot}	dB	4	4
Noc Note 3	dBm/15 kHz	-98	
\hat{E}_s/N_{oc}	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used	such that both c	ells are fully allocated	and a constant
total transmitted power			
Note 2: The resources for upl	ink transmissior	are assigned to the U	JE prior to the start
of time period T2.			

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant—over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.7.3.1-3: Cell specific test parameters for UTRAN TDD (cell # 2) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 2				
		T	1	T	2	
UTRA RF Channel number Note2			Chan	nel 2		
DL timeslot number		0	DwPTS	0	DwPTS	
PCCPCH_Ec/lor	dB	-3		-3		
DwPCH_Ec/lor	dB		0		0	
OCNS_Ec/lor	dB	-3		-3		
Îor/loc	dB	-Inf	inity	5		
PCCPCH RSCP Note1	dBm	-Infinity	n.a.	-73	n.a.	
lo Note1	dBm/1.28MHz	-Infinity		-70	-70.88	
loc	dBm/1.28MHz	-75				
Propagation condition			AW	GN		

Note 1: PCCPCH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel

Number can be set for the primary frequency in this test.

A.8.7.3.3 Test Requirements

The UE shall send the first measurement report containing the physical cell identity of cell 2, with a measurement reporting delay less than 12800 ms from the beginning of time period T2.

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.7.4 E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

A.8.7.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN TDD cells. This test will partly verify the Enhanced UTRA TDD cell identification requirements in clause 8.1.2.4.3.1.1a under AWGN propagation conditions.

The test parameters are given in Tables A.8.7.4.1-1, A.8.7.4.1-2 and A.8.7.4.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods of T1 and T2 respectively. During time period T1, measurement gaps are activated and an inter-RAT measurement reporting configuration is configured with linkage to a UTRA measurement object corresponding to UARFCN channel number 1. Prior to time duration T2, the UE shall not have any timing information of cell 2. Cell 2 is powered up at the beginning of T2.

Table A.8.7.4.1-1: General test parameters for E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	Applicable to cell 1
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Thresh	dBm	-83	Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list
T1	S	5	
T2	S	2	

Table A.8.7.4.1-2: Cell specific test parameters for cell 1 in E-UTRAN TDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions

Parameter	Unit	Cell	1
		T1	T2
E-UTRA RF Channel Number		1	
BW _{channel}	MHz	10	
OCNG Pattern defined in			
A.3.2.2.1 (OP.1 TDD)		OP.1 T	TDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
$\hat{E}_{\scriptscriptstyle \mathrm{s}}/I_{\scriptscriptstyle \mathrm{ot}}$	dB	4	4
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98	3
\hat{E}_s/N_{oc}	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWG	SN .

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.7.4.1-3: Cell specific test parameters for cell 2 in E-UTRAN TDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number Note1			Char	nel 1	
P-CCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor ^{Note2}	dB	-1.76	-1.76		
\hat{I}_{or}/I_{oc}	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
P-CCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
P-CCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.

Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.7.4.2 Test Requirements

The UE shall send the first measurement report containing the primary scrambling code of cell 2, with a measurement reporting delay less than 1120 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct measurement reports observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH

A.8.7.5 E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX

A.8.7.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN TDD- UTRAN TDD measurement requirements for increased UE carrier monitoring in clause 8.1.2.4.3.

The test parameters are given in Tables A.8.7.5.1-1, A.8.7.5.1-2 and A.8.7.5.1-3. In this test, there are 4 cells on different carrier frequencies and gap pattern configuration #0 as defined in table A.8.7.5.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Events B1 is used. The test consists of two successive time periods for every reptitation, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of neighoubour cells. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 7 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table A.8.7.5.1-1: General test parameters for E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-		1	Serving cell
UTRA RF Channel			
Number			
UE is configured		2, 3, 4, 5, 6, 7, 8	7 UTRA TDD carrier frequencies are used
UTRA RF channel			in the UE neighbour cell list. Frequencies
numbers			5,6, 7,and 8 are indicated to have reduced performance
Toot oquipment		Cell 1 uses E-UTRA RF cannel	performance
Test equipment configuration		number 1	
Comiguration		Cell 2,3,4 are randomly selected	
		to use different frequencies	
		selected from frequencies	
		2,3,4,5,6,7, 8	
Active cell		Cell 1	E-UTRA TDD cell
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
CP length of cell 1		normal	
Inter-RAT		UTRA TDD PCCPCH RSCP	
measurement			
quantity			
B1 Threshold	dBm	-75	UTRA TDD PCCPCH RSCP threshold for
		_	event B1
Hysteresis	dB	0	
Ofn	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Scaling factor		8	
configurations			
T1	S	5	
T2	S	205	

Table A.8.7.5.1-2: Cell specific test parameters for E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX (cell #1)

Parameter	Unit	Cell 1				
		T1	T2			
E-UTRA RF Channel Number		1				
BW _{channel}		5MHz: N	_{RB} = 25			
		$10MHz: N_{RB} = 50$				
Uplink-downlink configuration		1				
of cell 1 as specified in table						
4.2.2 in TS 36.211						
Special subframe configuration		6				
of cell 1 as specified in table						
4.2.1 in TS 36.211						
PDSCH parameters: DL		5MHz: R	.4 TDD			
Reference Measurement		10MHz: F	R.0 TDD			
Channel as specified in						
clause A.3.1.1.2						
PCFICH/PDCCH/PHICH		5MHz: R.				
parameters: DL Reference		10MHz:R	2.6 TDD			
Measurement Channel as						
specified in clause A.3.1.2.2						
OCNG Pattern defined in		5MHz: OF	-			
A.3.2.2.1 and A.3.2.2.9		10MHz:OI	P.1 TDD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB	0				
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N_{oc}	dBm/15 kHz	-98	3			
\hat{E}_s/N_{oc}	dB	4	4			
Ê /I Note 3	dB	4	4			
RSRP Note 3	dBm/15 kHz	-94	-94			
SCH_RP Note 3	dBm/15 kHz	-94	-94			
lo Note 3	dBm/Ch BW	-64.70	-64.70			
		+10log	+10log			
		(N _{RB,c} /50)	(N _{RB,c} /50)			
Propagation Condition		ETU	70			
Correlation Matrix and		1x2 Low				
Antenna Configuration						

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes.

They are not settable parameters themselves.

Table A.8.7.5.1-3: Cell specific test parameters for E-UTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX (cell #2, cell #3 and cell #4)

Parameter	Unit	Cell 2			Cell 3			Cell 4					
		T1			T2	T1 T2			T1		T2		
Timeslot Number		0 D	wPTS	0	DwPTS	0	DwPTS	0	DwPTS	0	DwPTS	0	DwPTS
UTRA RF		Rand	lomly se	elected fr	om 2,3,4	Ra	andomly se	lected fro	om 5,6,7,8	Ra	andomly se	ected fro	m 5,6,7,8
Channel Number		such	that cell	2 is in the	ne normal	suc	ch that cell	3 is in th	e reduced	su	ch that cell	4 is in the	e reduced
(NOTE1)			perform	nance gr	oup		perforr	nance gr	oup		erformance		
										cł	nannel is di	fferent fro	om Cell 3
											RF	channel.	
PCCPCH_Ec/lor	dB	-Inf	inity	-3			-Infinity	-3			-Infinity	-3	
DwPCH_Ec/lor	dB	-Inf	inity		0		-Infinity		0		-Infinity		0
OCNS_Ec/lor		-Inf	inity	-3			-Infinity	-3			-Infinity	-3	
\hat{I}_{or}/I_{oc}	dB	-Inf	inity	9			-Infinity	9			-Infinity	9	
I_{oc}	dBm/1.28 MHz			-70				-70				-70	
PCCPCH_RSCP	dB	-Inf	inity	-64			-Infinity	-64			-Infinity	-64	
lo Note 3	dBm/1.28	-70	0.00	-			-70.00	-			-70.00	-	
	MHz			60.49				60.49				60.49	
Propagation Condition			Case	3 (NOTE	2)		Case	3 (NOTE	2)		Case	3 (NOTE	2)

NOTE1: The DPCH of the cell is located in a timeslot other than 0.

NOTE2: Case 3 propagation conditions are specified in TS25.102 Annex B

NOTE3: PCCPCH_RSRP and lo levels have been derived from other parameters for information purposes. They are not settable

parameters themselves

A.8.7.5.2 Test Requirements

The UE shall send Event B1 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 21.95s (cell 2) and 204.8s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

A.8.7A TBD

A.8.7A.1 E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX

A.8.7A.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN FDD- UTRAN TDD measurement requirements for increased UE carrier monitoring in clause 8.1.2.4.4.

The test parameters are given in Tables A.8.7A.1.1-1, A.8.7A.1.1-2 and A.8.7A.1.1-3. In this test, there are 4 cells on different carrier frequencies and gap pattern configuration #0 as defined in table A.8.7A.1.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Events B1 is used. The test consists of two successive time periods for every reptitation, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of neighoubour cells. At the start of each repetition of T1, the test equipment provides signals for cell 1 (serving cell), and cells 2, 3 and 4 which are selected from the 7 cells which are configured in the UE neighbour cell list. Cells 2, 3 and 4 are chosen randomly, such that one frequency belongs to the normal performance group and two frequencies belong to the reduced performance group.

Table A.8.7A.1.1-1: General test parameters for E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX

Parameter	Unit	Value	Comment
UE configured E-		1	Serving cell
UTRA RF Channel			
Number			
UE is configured		2, 3, 4, 5, 6, 7, 8	7 UTRA TDD carrier frequencies are used
UTRA RF channel			in the UE neighbour cell list. Frequencies
numbers			5,6, 7,and 8 are indicated to have reduced performance
Test equipment		Cell 1 uses E-UTRA RF cannel	
configuration		number 1	
		Cell 2,3,4 are randomly selected	
		to use different frequencies	
		selected from frequencies	
		2,3,4,5,6,7, 8	
Active cell		Cell 1	E-UTRA FDD cell
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
CP length of cell 1		normal	
Inter-RAT		UTRA TDD PCCPCH RSCP	
measurement			
quantity			
B1 Threshold	dBm	-75	UTRA TDD PCCPCH RSCP threshold for
Lhistoropia	dB	0	event B1
Hysteresis		0	
TimeToTrigger	S	0	LOCK :
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Scaling factor		8	
configurations			
T1	S	5	
T2	S	205	

Table A.8.7A.1.1-2: Cell specific test parameters for E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX (cell #1)

Parameter	Unit	Cel	11			
		T1	T2			
E-UTRA RF Channel Number		1				
BW _{channel}		5MHz: $N_{RB} = 25$				
		$10MHz: N_{RB} = 50$				
PDSCH parameters: DL		5MHz: R				
Reference Measurement		10MHz: F	R.0 FDD			
Channel as specified in						
clause A.3.1.1.1						
PCFICH/PDCCH/PHICH		5MHz: R.				
parameters: DL Reference		10MHz:R	1.6 FDD			
Measurement Channel as						
specified in clause A.3.1.2.1						
OCNG Pattern defined in		5MHz: OP				
A.3.2.1.1 and A.3.2.1.15		10MHz:O	P.1 FDD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N_{oc}	dBm/15 kHz	-98	3			
\hat{E}_s/N_{oc}	dB	4	4			
$\hat{E}_{_{s}}/I_{_{ot}}^{}$ Note 3	dB	4	4			
RSRP Note 3	dBm/15 kHz	-94	-94			
SCH_RP Note 3	dBm/15 kHz	-94	-94			
lo Note 3	dBm/Ch BW	-64.76	-64.76			
		+10log	+10log			
		(N _{RB,c} /50)	(N _{RB,c} /50)			
Propagation Condition		ETU	70			
Correlation Matrix and		1x2 Low				
Antenna Configuration						

The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 2: Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes. Note 3:

They are not settable parameters themselves.

Table A.8.7A.1.1-3: Cell specific test parameters for E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured, non DRX (cell #2, cell #3 and cell #4)

Parameter	Unit	Cell 2			Cell 3			Cell 4		
		T1		T2	T1	T2		T1		T2
Timeslot Number		0 DwPTS	0	DwPTS	0 DwPTS	0	DwPTS	0 DwPTS	0	DwPTS
UTRA RF		Randomly se	elected fr	om 2,3,4	Randomly s	selected from	5,6,7,8	Randomly se	lected fro	m 5,6,7,8
Channel Number		such that cell	l 2 is in th	ne normal	such that ce	ell 3 is in the i	educed	such that cell	4 is in the	e reduced
(NOTE1)		perforn	nance gro	oup	perfo	rmance grou	p	performance	group. (Cell 4 RF
								channel is di	fferent fro	om Cell 3
								RF	channel.	
PCCPCH_Ec/lor	dB	-Infinity	-3		-Infinity	-3		-Infinity	-3	
DwPCH_Ec/lor	dB	-Infinity		0	-Infinity		0	-Infinity		0
OCNS_Ec/lor		-Infinity	-3		-Infinity	-3		-Infinity	-3	
\hat{I}_{or}/I_{oc}	dB	-Infinity	9		-Infinity	9		-Infinity	9	
I_{oc}	dBm/1.28 MHz		-70			-70			-70	
PCCPCH_RSCP	dB	-Infinity	-64		-Infinity	-64		-Infinity	-64	
lo Note 3	dBm/1.28	-70.00	-		-70.00	-60.49		-70.00	-	
	MHz		60.49						60.49	
Propagation Condition		Case	3 (NOTE	2)	Cas	e 3 (NOTE2)		Case	3 (NOTE	2)

NOTE1: The DPCH of the cell is located in a timeslot other than 0.

NOTE2: Case 3 propagation conditions are specified in TS25.102 Annex B

NOTE3: PCCPCH_RSRP and lo levels have been derived from other parameters for information purposes. They are not settable

parameters themselves

A.8.7A.1.2 Test Requirements

The UE shall send Event B1 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 21.95s (cell 2) and 204.8s (cell 3 and 4) from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report.

A.8.8 E-UTRAN FDD – GSM Measurements

A.8.8.1 E-UTRAN FDD – GSM event triggered reporting in AWGN

A.8.8.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter-RAT (GSM) measurements. This test will partly verify the E-UTRAN FDD - GSM cell search requirements in clause 8.1.2.4.5.

The test parameters are given in Tables A.8.8.1.1-1, A.8.8.1.1-2 and A.8.8.1.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.8.1.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.1.
(E-UTRAN FDD)		Channel R.6 FDD	
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1	List of GSM cells provided before T2 starts.
T1	S	5	
T2	S	5	

Table A.8.8.1.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10)		
OCNG Pattern defined in					
A.3.2.1.1 (OP.1 FDD)		OP.1	FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	0			
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
\hat{E}_{s}/I_{ot}	dB	4	4		
\hat{E}_s/N_{oc}	dB	4	4		
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWGN			

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

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.8.1.1-3: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 2		
		T1	T2	
Absolute RF Channel Number		ARFNC 1		
RXLEV	dBm	-Infinity	-75	
GSM BSIC		N/A	Valid	

A.8.8.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report including BSIC of cell # 2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.
- NOTE 2: The delay for GSM cell identification with BSIC verified is equal to 3120 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = 2*T_{Measurement Period, GSM} = 2* 480ms = 960ms.

Initial BSIC identification delay = 2160 ms.

A.8.8.2 E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

A.8.8.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN FDD-GSM cell search requirements when DRX is used in clause 8.1.2.4.5.2.

In these tests, there are two cells, one E-UTRAN cell and one GSM cell, and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

The common test parameters are given in Table A.8.8.2.1-1. Cell specific test parameters are given in Table A.8.8.2.1-2 for E-UTRAN and in Table A.8.8.2.1-5 for GSM. DRX configuration for Test1 and Test2 are given in Table A.8.8.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.8.2.1-4.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.8.2.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment
		Va	lue	
PDSCH parameters (E-		DL Reference Measurement		As specified in clause A.3.1.1.1.
UTRAN FDD)		Channel R.0 FDD)	
PCFICH/PDCCH/PHICH		DL Reference Me		As specified in clause A.3.1.2.1.
parameters (E-UTRAN FDD)		Channel R.6 FDD)	
Gap Pattern Id		0		As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on Absolute RF Channel Number
Neighbour ceil		Cell 2		1 (GSM cell)
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel		,	1	One E-UTRA FDD carrier frequency is
Number				used.
E-UTRA Channel Bandwidth	MHz	1	0	
(BW _{channel})				
Inter-RAT (GSM)		GSM Car	rier RSSI	
measurement quantity				
B1-Threshold-GERAN	dBm	-80		GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	S	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access
				procedure.
DRX		ON		DRX related parameters are defined in
				Table A.8.8.2.1-3
Monitored GSM cell list size		6 GSM neighbours including		List of GSM cells provided before T2
		ARFCN 1		starts.
T1	S	5		
T2	S	5	45	

Table A.8.8.2.1-2: Cell specific test parameters for E-UTRAN FDD (cell #1) event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 1
		T1 T2
E-UTRA RF Channel Number		1
BW _{channel}	MHz	10
OCNG Pattern defined in		
A.3.2.1.1 (OP.1 FDD)		OP.1 FDD
PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	_
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 1}	dB	
OCNG_RB ^{Note 1}	dB	

$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4
$N_{oc}^{ m Note 2}$	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
\hat{E}_s/N_{oc}	dB	4	4
Propagation Condition		AWGN	

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant N

over subcarriers and time and shall be modelled as AWGN of appropriate power for $^{IV}_{oc}$ to be fulfilled.

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

Table A.8.8.2.1-3: drx-Configuration to be used in E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment			
rieiu	Value	Value				
onDurationTimer	psf1	psf1				
drx-InactivityTimer	psf1	psf1				
drx-RetransmissionTimer	psf1	psf1				
longDRX-CycleStartOffset	sf40	sf1280				
shortDRX	Disable	Disable				
Note: For further in	Note: For further information see clause 6.3.2 in TS 36.331.					

Table A.8.8.2.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
rieid	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see clause 6.3.2 in TS 36.331.
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

Table A.8.8.2.1-5: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 2		
		T1	T2	
Absolute RF Channel Number		ARFNC 1		
RXLEV	dBm	-Infinity	-75	
GSM BSIC		N/A	Valid	

A.8.8.2.2 Test Requirements

In Test1 the UE shall send one Event B1 triggered measurement report including BSIC of cell #2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 42.8 seconds from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

A.8.8.3 E-UTRAN FDD – GSM event triggered reporting in AWGN with enhanced BSIC identification

A.8.8.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter-RAT (GSM) measurements with enhanced BSIC identification. This test will partly verify the E-UTRAN FDD - GSM cell search requirements in clause 8.1.2.4.5.1.2a

The test parameters are given in Tables A.8.8.3.1-1, A.8.8.1.1-2 and A.8.8.3.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. Prior time duration T1, the UE shall not have any timing information of cell 2. During time period T1, gaps are activated and an interRAT measurement reporting configuration is configured, and linked to a GSM measurement object including channel ARFCN 1. Cell 2 is powered up at the beginning of T2.

Table A.8.8.3.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting in AWGN with enhanced BSIC identification

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1	List of GSM cells provided before T2 starts.
T1	S	5	T1 ends at the end of the last TTI where the measurement configuration is given
T2	S	3	

Table A.8.8.3.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of GSM cell in AWGN with enhanced BSIC identification

Parameter	Unit	Cel	l 1
		T1	T2
E-UTRA RF Channel Number		1	
BW _{channel}	MHz	10)
OCNG Pattern defined in			
A.3.2.1.1 (OP.1 FDD)		OP.1	FDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	4	4
\hat{E}_s/N_{oc}	dB	4	4
N_{oc}	dBm/15 kHz	-98	8
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWO	GN

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.8.3.1-3: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell in AWGN with enhanced BSIC identification

Parameter	Unit	Cell 2		
		T1	T2	
Absolute RF Channel Number		ARFCN 1		
RXLEV	dBm	-∞	-75	
GSM BSIC		N/A	Valid	

A.8.8.3.2 Test Requirements

The UE shall send one Event B1 triggered measurement report including BSIC of cell # 2, with a measurement reporting delay less than 2280 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE 1: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 2: The delay for GSM cell identification with BSIC verified is equal to 2280 ms, which is the sum of the event triggered measurement reporting delay and the enhanced initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM} = 2*480ms = 960ms$.

Initial BSIC identification delay = 1320 ms.

A.8.9 E-UTRAN FDD - UTRAN TDD measurements

A.8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting in fading propagation conditions

A.8.9.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. The test will partly verify the E-UTRAN FDD - UTRAN TDD cell search requirements in clause 8.1.2.4.4 in fading environment.

The test parameters are given in Table A.8.9.1.1-1, A.8.9.1.1-2 and A.8.9.1.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.9.1.1-1: General test parameters for Event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1
parameters		Channel R.6 FDD	
Active cell		Cell 1	E-UTRA FDD Cell 1
Neighbour cell		Cell 2	UTRA TDD Cell 2 is to be identified.
Gap Pattern Id		1	As specified in TS 36.133 section8.1.2.1.
			Measurement Gap Repetition Period =
			80ms
Inter-RAT measurement		UTRA TDD PCCPCH RSCP	
quantity			
Threshold other system	dBm	-75	UTRA TDD PCCPCH RSCP threshold for event B1.
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
T1	S	5	
T2	S	15	

Table A.8.9.1.1-2: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell1)

Parameter	Unit	Cell 1		
		T1	T2	
E-UTRA RF Channel		1		
Number				
BW _{channel}	MHz	10)	
Correlation Matrix and		1x2 l	_OW	
Antenna Configuration				
OCNG Patterns defined		OP.1	FDD	
in A.3.2.1.1 (OP.1 FDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB	_		
PHICH_RB	dB	0		
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
N_{oc}	dBm/15KH	-9	8	
1 voc	Z			
RSRP	dBm	-94	-94	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4 4		
P-SCH_RP	dBm	-9	4	
S-SCH_RP	dBm	-9	4	
Propagation Condition		ETU70		
	1: OCNG shall be used such that cell 1 is fully allocated and a			

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.9.1.1-3: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell2)

Parameter	Unit	Cell 2				
		T1			Τ2	
Timeslot Number		0	DwPTS	0	DwPTS	
UTRA RF Channel			Cha	annel1		
Number (NOTE1)						
PCCPCH_Ec/lor	dB	-In	finity	-3		
DwPCH_Ec/lor	dB	-In	finity		0	
OCNS_Ec/lor		-Infinity		-3		
\hat{I}_{or}/I_{oc}	dB	-Infinity		9		
I_{oc}	dBm/1.28 MHz	-70				
PCCPCH_RSCP Note 3	dB	-Infinity		-64		
lo Note 3	dBm/1.28 MHz	-70.00		-60.49		
Propagation		Case 3 (NOTE2)				
Condition			1 4 41 41	•		

NOTE1: The DPCH of the cell is located in a timeslot other than 0.

NOTE2: Case 3 propagation conditions are specified in TS25.102 Annex B

NOTE3: PCCPCH_RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves

A.8.9.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 12800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2 x TTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.9.2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

A.8.9.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN cells. This test will partly verify the enhanced UTRA TDD cell identification requirements in clause 8.1.2.4.4 under AWGN propagation conditions.

This test scenario comprised of 1 E-UTRA FDD serving cell, and 1 UTRA TDD cell to be searched. Test parameters are given in Table A.8.9.2.1-1, A.8.9.2.1-2, and A.8.9.2.1-3. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time period T1, gaps are activated and an interRAT measurement reporting configuration is configured, and linked to a UTRA measurement object corresponding to channel UARFCN 1. Prior to time duration T2, the UE shall not have any timing information of cell 2. Cell 2 is powered up at the beginning of the T2.

Table A.8.9.2.1-1: General test parameters for E-UTRAN FDD- UTRAN TDD enhanced cell search in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Inter-RAT (UTRA TDD)		P-CCPCH RSCP	
measurement quantity			
Thresh	dBm	-83	Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list
Time offset between cells	ms	3	
T1	S	5	
T2	S	2	

Table A.8.9.2.1-2: Cell specific test parameters for cell #1 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Parameter Unit Cell 1				
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	1	0		
OCNG Patterns defined in		OP 1	FDD		
A.3.2.1.1 (OP.1 FDD)		OF.1	רטט		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB)		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
\hat{E}_{s}/I_{ot}	dB	4	4		
Noc Note 3	dBm/15 kHz	-6	98		
\hat{E}_s/N_{oc}	dB	4	4		
RSRP Note 4	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AW	GN		
Note 1: OCNG shall be used	such that both c	ells are fully allocated	and a constant		
		ty is achieved for all C			

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.9.2.1-3: Cell specific test parameters for cell #2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		Dw	PTS
		T1	T2	T1	T2
UTRA RF Channel Number Note1			Char	nel 1	
P-CCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor ^{Note2}	dB	-1.76	-1.76		
\hat{I}_{or}/I_{oc}	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
P-CCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
P-CCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.

Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for

information purposes. They are not settable parameters themselves.

A.8.9.2.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 1120 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.10 E-UTRAN TDD – GSM Measurements

A.8.10.1 E-UTRAN TDD – GSM event triggered reporting in AWGN

A.8.10.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter-RAT (GSM) measurements. This test will partly verify the E-UTRAN TDD - GSM cell search requirements in clause 8.1.2.4.6.

The test parameters are given in Tables A.8.10.1.1-1, A.8.8.1.1-2 and A.8.10.1.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.10.1.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2.
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1	List of GSM cells provided before T2 starts.
T1	S	5	
T2	S	5	

Table A.8.10.1.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of **GSM cell in AWGN**

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		,	1		
BW _{channel}	MHz	1	0		
OCNG Pattern defined in					
A.3.2.2.1 (OP.1 TDD)		OP.1	TDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB]			
PCFICH_RB	dB				
PHICH_RA	dB		_		
PHICH_RB	dB	j)		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$\mathbf{\hat{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4		
$N_{oc}^{$	dBm/15 kHz	-98			
\hat{E}_s/N_{oc}	dB	4	4		
RSRP Note 4	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWGN	·		

spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{
m ac}$ to be

RSRP levels have been derived from other parameters for information purposes. They are not Note 4: settable parameters themselves

Table A.8.10.1.1-3: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell in

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid
Propagation Condition		AWGN	

A.8.10.1.2 **Test Requirements**

The UE shall send one Event B1 triggered measurement report including the valid BSIC of cell #2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE 1: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 2: The delay for GSM cell identification with BSIC verified is equal to 3120 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = 2*T_{Measurement Period, GSM} = 2* 480ms = 960ms.

Initial BSIC identification delay = 2160 ms.

A.8.10.2 E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

A.8.10.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN TDD-GSM cell search requirements when DRX is used in clause 8.1.2.4.6.

In these tests, there are two cells, one E-UTRAN cell and one GSM cell, and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

The common test parameters are given in Table A.8.10.2.1-1. Cell specific test parameters are given in Table A.8.10.2.1-2 for E-UTRAN and in Table A.8.10.2.1-5 for GSM. DRX configuration for Test1 and Test2 are given in Table A.8.10.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.10.2.1-4.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.10.2.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment		
		Va	lue			
PDSCH parameters (E-		DL Reference Me	easurement	As specified in clause A.3.1.1.2. Note that		
UTRAN TDD)		Channel R.0 TDD		UE may only be allocated at On Duration		
PCFICH/PDCCH/PHICH		DL Reference Me	easurement	As specified in clause A.3.1.2.2.		
parameters (E-UTRAN TDD)		Channel R.6 TDE)			
Gap Pattern Id		0		As specified in TS 36.133 clause 8.1.2.1.		
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.		
Neighbour cell		Cell 2		Cell 2 is on Absolute RF Channel Number 1 (GSM cell)		
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211.		
Uplink-downlink configuration		1		As specified in TS 36.211 clause 4.2 Table 4.2-2		
CP length		Normal		Applicable to cell 1		
E-UTRA RF Channel		1		One E-UTRA TDD carrier frequency is		
Number				used.		
E-UTRA Channel Bandwidth (BW _{channel})	MHz	1	0			
Inter-RAT (GSM) measurement quantity		GSM Car	rier RSSI			
B1-Threshold-GERAN	dBm	-80		GSM Carrier RSSI threshold for event B1.		
Hysteresis	dB	0				
TimeToTrigger	S	0				
Filter coefficient		0		L3 filtering is not used		
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211		
Access Barring Information	-	Not Sent		Not Sent		No additional delays in random access procedure.
DRX		ON		ON		DRX related parameters are defined in Table A.8.10.2.1-3
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1				List of GSM cells provided before T2 starts.
T1	S	5				
T2	S	5	45			

Table A.8.10.2.1-2: Cell specific test parameters for E-UTRAN TDD (cell #1) event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 1				
		T1	T2			
E-UTRA RF Channel Number			1			
BW _{channel}	MHz	10				
OCNG Patterns defined in						
A.3.2.2.1 (OP.1 TDD)		OP.1	TDD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB	0				
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB]				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4			
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98				
RSRP Note 3	dBm/15 kHz	-94	-94			
SCH_RP	dBm/15 kHz	-94	-94			
\hat{E}_s/N_{oc}	dB	4	4			
Propagation Condition		AWGN	·			

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

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

Table A.8.10.2.1-3: drx-Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
rieid	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
IongDRX-CycleStartOffset	sf40	sf1280	
shortDRX	Disable	Disable	
Note: For further information see clause	6.3.2 in TS 3	6.331.	

Table A.8.10.2.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
Field	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see
TimeAlignmentTime	31300	31300	clause 6.3.2 in TS 36.331.
			For further information see
sr-ConfigIndex	2	2	clause 6.3.2 in TS 36.331 and
			clause 10.1 in TS 36.213.

Table A.8.10.2.1-5: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	(Cell 2
		T1	T2
Absolute RF Channel Number		AF	RFNC 1
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

A.8.10.2.2 Test Requirements

In Test1 the UE shall send one Event B1 triggered measurement report including BSIC of cell #2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 42.8 seconds from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

A.8.11 Monitoring of Multiple Layers

A.8.11.1 Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions

A.8.11.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of multiple events. This test will partly verify the FDD-FDD inter-frequency cell search requirements in clause 8.1.2.3.

The test parameters are given in Tables A.8.11.1.1.1-1 and A.8.11.1.1.1-2. In this test, there are three cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 or cell 3.

Table A. 8.11.1.1-1: General test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1
parameters		Channel R.6 FDD	
E-UTRA RF Channel		1, 2, 3	Three FDD carrier frequencies are used.
Number			
Channel Bandwidth	MHz	10	
(BW _{channel})			
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2 and cell 3	Cell 2 is on RF channel number 2 and cell
			3 is on RF channel number 3
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-		3 ms	Asynchronous cells
UTRAN FDD cells			
T1	S	5	
T2	S	10	

Table A.8.11.1.1-2: Cell specific test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading

Parameter	Unit	C	ell 1	Cel	l 2	Cell 3	Cell 3	
		T1	T2	T1 T2		T1	T2	
E-UTRA RF Channel			1	2		3		
Number								
BW _{channel}	MHz		10	10)	10		
Correlation Matrix and		1	1x2	1x2 l	_OW	1x2 Low		
Antenna								
Configuration								
OCNG Patterns								
defined in A.3.2.1.1		OP.	1 FDD	OP.2	FDD	OP.2 FDD		
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB		_	0				
PHICH_RB	dB		0			0		
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$N_{oc}^{ m Note 3}$	dBm/15				-98			
	kHz							
RSRP Note 4	dBm/15	-98	-98	-Infinity	-95	-Infinity	-95	
	kHz							
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	0	0	-Infinity	3	-Infinity	3	
SCH_RP Note 4	dBm/15	-98	-98	-Infinity	-95	-Infinity	-95	
	kHz							
\hat{E}_s/N_{oc}	dB	0	0	-Infinity	3	-Infinity	3	
Propagation Condition			VGN	ETU		ETU70		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted								

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.11.1.2 Test Requirements

The UE shall send Event A3 triggered measurement reports for both cell 2 and cell 3, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.11.2 E-UTRAN TDD – E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions

A.8.11.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of two events. This test will partly verify the TDD-TDD inter-frequency cell search requirements in clause 8.1.2.3.

The test parameters are given in Tables A.8.11.2.1-1 and A.8.11.2.1-2. In this test, there are three cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3.

Table A.8.11.2.1-1: General test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Interfrequency event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in TS 36.211 clause 4.2 Table 4.2-2
E-UTRA RF Channel Number		1, 2, 3	Three TDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbor cells		Cell 2 and Cell 3	Cell 2 and 3 are on RF channel numbers 2 and 3 respectively
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	10	

Table A.8.11.2.1-2: Cell specific test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Interfrequency event triggered reporting under fading propagation conditions cells

Parameter	Unit	Ce	ell 1	Cel	12	Cell 3	
Parameter	Unit	T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
BW _{channel}	MHz	,	10	10)	10)
Correlation Matrix and		1	x2	1x2 L	-OW	1x2 L	_OW
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD		OP.2 TDD	
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB			0		0	
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{ m Note 3}$	dBm/15 kHz			-9	8		
RSRP Note 4	dBm/15 kHz	-98	-98	-inf	-95	-inf	-95
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	0	0	-inf	3	-inf	3
SCH_RP Note 4	dBm/15 kHz	-98	-98	-inf	-95	-inf	-95
\hat{E}_s/N_{oc}	dB	0	0	-inf	3	-inf	3
Propagation Condition		AV	/GN	ETU	70	ETU	70

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.11.2.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for cell 2 with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall send one Event A3 triggered measurement report for cell 3 with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE 1: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

A.8.11.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency and UTRAN FDD measurements. This test will partly verify the FDD-FDD inter-frequency cell search requirements in clause 8.1.2.3 and the E-UTRAN FDD- UTRAN FDD cell search requirements in clause 8.1.2.4.1.

The test parameters are given in Tables A.8.11.3.1-1, A.8.11.3.1-2 and A.8.11.3.1-3. In this test, there are two cells on different carrier frequencies and one cell on UTRAN carrier frequency and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and B2 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3.

Table A.8.11.3.1-1: General test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1.
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
E-UTRAN FDD measurement		RSRP	
quantity Inter-RAT (UTRA FDD)		CPICH Ec/N0	
measurement quantity		0.10.1.25,110	
A3-Offset	dB	-6	
b2-Threshold-E-UTRA	dB	-86	RSRP threshold for event B2.
b2-Threshold-UTRA	dB	-18	CPICH Ec/N0 threshold for event B2.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	8	

Table A.8.11.3.1-2: Cell specific test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Ce	II 1	Ce	II 2		
		T1	T2	T1	T2		
E-UTRA RF Channel			1	2	2		
Number							
BW _{channel}	MHz	1	0	1	0		
Correlation Matrix and		1	x2	1x2	Low		
Antenna Configuration							
OCNG Patterns							
defined in A.3.2.1.1		OP.1	FDD	OP.2	FDD		
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		^				
PHICH_RB	dB		0	0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{ m Note~3}$	dBm/15 kHz			-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7		
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7		
Propagation Condition		AW	/GN	ETU	J70		
Note 1: OCNG shall be	a used such that both	h calla ara fully	allocated and a	constant total tran	amittad navyar		

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant

over subcarriers and time and shall be modelled as AWGN of appropriate power for $^{N_{oc}}$ to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.11.3.1-3: Cell specific test parameters for UTRAN FDD (cell # 3) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 3				
		T1	T2			
UTRA RF Channel Number		1				
CPICH_Ec/lor	dB	-10				
PCCPCH_Ec/lor	dB	-12				
SCH_Ec/lor	dB	-12				
PICH_Ec/lor	dB	-15				
DPCH_Ec/lor	dB	N/A				
OCNS		-0.94	1			
\hat{I}_{or}/I_{oc}	dB	-Infinity -1.8				
I_{oc}	dBm/3.84 MHz	-70				
CPICH_Ec/lo	dB	-Infinity -14				
Propagation Condition		Case 5 (N	ote 3)			

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal

to l_{or}.

Note 3: Case 5 propagation conditions are defined in Annex A of TS 25.101.

A.8.11.3.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search test case

A.8.11.4.1 Test Purpose and Environment

This test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements and UTRA TDD measurements. The test will partly verify the requirements in clause 8.1.2.3.2 combined 8.1.2.4.3 under fading propagation conditions.

This test scenario comprised of 2 E-UTRA TDD cells operating on different frequency, and 1 UTRA TDD cell. Test parameters are given in table A.8.11.4.1-1, A.8.11.4.1-2, and A.8.11.4.1-3. Gap pattern configuration #0 as defined in clause 8.1.2.1 is provided.

The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used.

Table A.8.11.4.1-1: General test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cells search under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference	As specified in clause A.3.1.1.2
		Measurement	
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH		DL Reference	As specified in clause A.3.1.2.2
parameters		Measurement	
		Channel R.6 TDD	
Active cell		Cell 1	E-UTRA TDD cell is on RF channel number 1
Neighbour cell		Cell 2	E-UTRA TDD cell is on RF channel number 2
		Cell 3	1.28Mcps TDD cell
CP length of cell1 and cell2		Normal	
Uplink-downlink configuration		1	As specified in Table 4.2-2 in TS 36.211. The
of cell1 and cell2			same configuration in both cells
Special subframe		6	As specified in table 4.2-1 in TS 36.211. The
configuration of cell1 and			same configuration in both cells
cell2			
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
E-UTRAN TDD		RSRP	
measurement quantity			
UTRAN TDD measurement		RSCP	
quantity			
DRX		OFF	
Ofn	dB	0	Parameter for A3 and B2 event
Ocn	dB	0	Parameter for A3 event
Hysteresis	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	Parameter for A3 event
Thresh1	dBm	-86	Absolute E-UTRAN RSRP threshold for event
			B2
Thresh2	dBm	-84	Absolute UTRAN RSCP threshold for event B2
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
Time offset between E-	μs	3	Synchronous cells
UTRAN TDD cells	·		
T1	S	>5	During T1, cell 2 and cell 3 shall be powered off.
			During the off time the physical layer cell identity
			of cell 2 shall be changed, and the primary
			scrambling code of cell 3 shall be changed.
T2	S	15	

Table A.8.11.4.1-2: Cell specific test parameters for combined E-UTRAN TDD inter-frequency and UTRA TDD cell search under fading propagation conditions(cell1 and cell2)

Parameter	Unit	Ce	ll 1	Cell 2			
		T1	T2	T1	T2		
E-UTRA RF Channel		1		2			
Number							
BWchannel	MHz	1	0	1	0		
Correlation Matrix and		1:	x2	1x2	Low		
Antenna Configuration							
OCNG Pattern defined							
in A.3.2.2.1 (OP.1		OP.1	TDD	OP.2	TDD		
TDD) and in A.3.2.2.2							
(OP.2)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		•				
PHICH_RB	dB	(0	0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RANote 1	dB						
OCNG_RBNote 1	dB						
\hat{E}_s/I_{ot}	dB	4	4	-Infinity	7		
\hat{E}_s/N_{oc}	dB	4	4 4		7		
N_{oc}	dBm/15 kHz	-98					
RSRP	dBm/15 kHz	-94	-94	-Infinity	-91		
SCH_RP	dBm/15 kHz	-94	-94	-infinity	-91		
Propagation Condition		AW	/GN	ET	J70		

Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.

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

Table A.8.11.4.1-3: Cell specific test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cell search under fading propagation conditions(cell3)

Parameter	Unit	Cell 3 (UTRA)				
Timeslot Number		0		DwF	PTS	
		T1 T2		T1	T2	
UTRA RF Channel	Channel 3					
Number*						
PCCPCH_Ec/lor	dB	-(3			
DwPCH_Ec/lor	dB			0		
OCNS_Ec/lor	dB	-(3			
\hat{I}_{or}/I_{oc}	dB	-Infinity	9	-Infinity	9	
I_{oc}	dBm/1.28 MHz	-80				
PCCPCH RSCP	dBm	-Infinity	-74	n.a	а.	
Propagation Condition		Case 3				
Note1: The DPCH of all calls are located in a timeslot other than 0						

Note1: The DPCH of all cells are located in a timeslot other than 0.

Note2: In the case of multi-frequency network, the UTRA RF Channel Number

can be set for the primary frequency in this test.

Note3: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.11.4.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 12.8s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.11.5 Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

A.8.11.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements. This test will partly verify the E-UTRAN FDD-FDD inter-frequency cell search requirements in clause 8.1.2.3.1 and simultaneously the E-UTRAN FDD- GSM cell search requirements in clause 8.1.2.4.5.

The test parameters are given in Tables A.8.11.5.1-1, A.8.11.5.1-2 and A.8.11.5.1-3. In this test, there are two cells on different carrier frequencies and one GSM cell. Gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and B2 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3.

Table A.8.11.5.1-1: General test parameters for combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-		DL Reference Measurement	As specified in clause A.3.1.1.1.
UTRAN FDD)		Channel R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1.
parameters		Channel R.6 FDD	
(E-UTRAN FDD)			
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on Absolute RF Channel Number 3
			(GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth	MHz	10	Applicable to cell 1 and cell 2
(BW _{channel})	IVII IZ		
E-UTRAN FDD measurement		RSRP	
quantity			
Hysteresis	dB	0	Parameter for A3 and B2 event
A3-Offset	dB	-6	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E- UTRAN FDD cells	ms	3 ms	Asynchronous cells
Inter-RAT (GSM)		GSM Carrier RSSI	
measurement quantity			
b2-Threshold-E-UTRA	dBm	-83	RSRP threshold for event B2. This is the threshold for E-UTRA in the B2 configuration. E-UTRA PCell RSRP is below this throughout the test to account for measurement accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	S	5	
T2	S	10	

Table A.8.11.5.1-2: Cell specific test parameters for E-UTRAN FDD cells for combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Cell 1		Се	II 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1		2	
Number						
BW _{channel}	MHz	1	0	1	0	
Correlation Matrix and		1x2	Low	1x2	Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OP.2	? FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB		_	0		
PHICH_RB	dB	(0			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{$	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
Propagation Condition		ET	Ú70	ET	U70	
Note 1. OCNC shall be used such that both calls are fully allocated and a constant total transmitted navier anactral						

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.11.5.1-3: Cell specific test parameters for GSM (cell # 3) for combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Cell 3		
		T1	T2	
Absolute RF Channel Number		ARFCN3		
RXLEV	dBm	-Infinity	-75	
GSM BSIC		N/A	Valid	

A.8.11.5.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report including BSIC of cell 3, with a measurement reporting delay less than 7200 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.
- NOTE 2: The delay for GSM cell identification with BSIC verified is equal to 7200 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM} = 2*N_{freq}*480ms = 1920ms$.

Initial BSIC identification delay = 5280 ms, when one carrier frequency other than GSM is monitored in the gaps.

A.8.11.6 Combined E-UTRAN TDD – E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

A.8.11.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements. This test will partly verify the E-UTRAN TDD-TDD inter-frequency cell search requirements in clause 8.1.2.3.2 and simultaneously the E-UTRAN TDD- GSM cell search requirements in clause 8.1.2.4.6.

The test parameters are given in Tables A.8.11.6.1-1, A.8.11.6.1-2 and A.8.11.6.1-3. In this test, there are two cells on different carrier frequencies and one GSM cell. Gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and B2 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3.

Table A.8.11.6.1-1: General test parameters for combined E-UTRAN TDD – E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-		DL Reference Measurement	As specified in clause A.3.1.1.2.
UTRAN TDD)		Channel R.0 TDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2.
parameters		Channel R.6 TDD	
(E-UTRAN TDD)			
Special subframe		6	As specified in table 4.2-1 in TS 36.211. The
configuration of cell1 and			same configuration in both cells
cell2			
Uplink-downlink configuration		1	As specified in TS 36.211 clause 4.2 Table 4.2-2
of cell1 and cell2			
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2.
			Cell 3 is on Absolute RF Channel Number 3
			(GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
E-UTRAN TDD measurement		RSRP	
quantity			
Hysteresis	dB	0	Parameter for A3 and B2 event
A3-Offset	dB	-6	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-	μs	3	Synchronous cells
UTRAN TDD cells			
Inter-RAT (GSM)		GSM Carrier RSSI	
measurement quantity			
b2-Threshold-E-UTRA	dBm	-83	RSRP threshold for event B2. This is the
			threshold for E-UTRA in the B2 configuration. E-
			UTRA PCell RSRP is below this throughout the
			test to account for measurement accuracy and
			fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	S	5	
T2	S	10	

Table A.8.11.6.1-2: Cell specific test parameters for E-UTRAN TDD cells for combined E-UTRAN TDD – E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Cell 1		Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		,	1		2	
Number						
BW _{channel}	MHz	1	0	1	10	
Correlation Matrix and		1x2	Low	1x2	Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.2.1		OP.1	TDD	OP.2	2 TDD	
(OP.1 TDD) and in						
A.3.2.2.2 (OP.2 TDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB			0		
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB		_			
PHICH_RB	dB	()			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~3}$	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
Propagation Condition		ET	J70	ET	U70	

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.11.6.1-3: Cell specific test parameters for GSM (cell # 3) for combined E-UTRAN TDD – E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	(Cell 3	
		T1	T2	
Absolute RF Channel Number		ARFCN3		
RXLEV	dBm	-Infinity	-75	
GSM BSIC		N/A	Valid	

A.8.11.6.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report including BSIC of cell 3, with a measurement reporting delay less than 7200 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.
- NOTE 2: The delay for GSM cell identification with BSIC verified is equal to 7200 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM} = 2*N_{freq}*480ms = 1920ms$.

Initial BSIC identification delay = 5280 ms, when one carrier frequency other than GSM is monitored in the gaps.

A.8.12 RSTD Intra-frequency Measurements

A.8.12.1 E-UTRAN FDD intra-frequency RSTD measurement reporting delay test case

A.8.12.1.1 Test Purpose and Environment

The purpose of the test is to verify that the RSTD measurement meets the requirements specified in Clause 8.1.2.5.1 in an environment with fading propagation conditions.

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the reference as well as the PCell. Cell 2 and Cell 3 are the neighbour cells. All cells are on the same RF channel.

The test consists of three consecutive time intervals, with duration of T1, T2 and T3. Cell 1 is active in T1, T2 and T3, whilst Cell 2 and Cell 3 are activated only in the beginning of T2. Cell 2 is active until the end of T3, and Cell 3 is active until the end of T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the reference cell, where the PRS positioning occasion is as defined in Clause 8.1.2.5.1. Cell 1 transmits PRS in T2, while Cell 2 transmits PRS only in T3, and Cell 3 transmits PRS only in T2. Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

The test parameters are as given in Table A.8.12.1.1-1, Table A.8.12.1.1-2, Table A.8.12.1.1-3 and Table A.8.12.1.1-4.

Table A.8.12.1.1-1: General test parameters for E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Parameter	Unit	Value	Comment
Reference cell		Cell 1	Reference cell is the cell in the OTDOA assistance data with respect to which the RSTD measurement is defined, as specified in TS 36.214 [4] and TS 36.355 [24]. The reference cell is the PCell in this test case.
Neighbor cells		Cell 2 and Cell 3	Cell 2 and Cell 3 appear at random places in the neighbour cell list in the OTDOA assistance data, but Cell 2 always appears in the first half of the list, whilst Cell 3 appears in the second half of the list.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Channel Bandwidth (BW _{channel})	MHz	10	
PRS Transmission Bandwidth	RB	50	PRS are transmitted over the system bandwidth
PRS configuration index I_{PRS}		171	This corresponds to periodicity of 320 ms and PRS subframe offset of $I_{\rm PRS}$ –160 DL subframes, as defined in TS 36.211 [16], Table 6.10.4.3-1
Number of consecutive downlink positioning subframes N_{PRS}		1	As defined in TS 36.211 [16]. The number of subframes in a positioning occasion
Physical cell ID PCI		(PCI of Cell 1 – PCI of Cell 2)mod6=0 and (PCI of Cell 1 – PCI of Cell 3)mod6=0	The cell PCIs are selected such that the relative shifts of PRS patterns among cells are as given by the test parameters
CP length		Normal	DRX parameters are further
DRX		ON	specified in Table A.8.12.1.1-3
Radio frame receive time offset between the cells at the UE antenna connector	μs	Cell 2 to Cell 1: 1 Cell 3 to Cell 1: -1	PRS are transmitted from synchronous cells
Expected RSTD	μs	Cell 2: 3 Cell 3: 3 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
Expected RSTD uncertainty for all neighbour cells	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
Number of cells provided in OTDOA assistance data		16	Including the reference cell
PRS muting info		Cell 1: '11110000' Cell 2: '00001111' Cell 3: '11110000'	Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	s	3	The length of the time interval from the beginning of each test
T2	S	1.28	The length of the time interval that follows immediately after time interval T1
Т3	s	1.28	The length of the time interval that follows immediately after time interval T2

Table A.8.12.1.1-2: Cell-specific test parameters for E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions during T1

Parameter	Unit	Cell 1	Cell 2	Cell 3		
E-UTRA RF Channel Number		1	1	1		
Correlation Matrix and Antenna Configuration		1x2 Low	1x2 Low	1x2 Low		
OCNG patterns defined in A.3.2.1		OP.5 FDD	N/A	N/A		
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA	dB	0	N/A	N/A		
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
OCNG_RA ^{Note 1}						
OCNG_RB ^{Note 1}						
$N_{oc}^{ m Note 3}$	dBm/ 15 kHz		-95			
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-Infinity	-Infinity	-Infinity		
lo Note 4	dBm/ 9 MHz	-67.22	N/A	N/A		
$\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$	dB	0	-Infinity	-Infinity		
Propagation Condition		ETU30				
Note 1: OCNG shall b	ne used suc	h that active cell (Cell 1)	is fully allocated and a c	onstant total		

- Note 1: OCNG shall be used such that active cell (Cell 1) is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 4: lo levels have been derived from other parameters and are given for information purpose. These are not settable test parameters.

Table A.8.12.1.1-3: Cell-specific test parameters for E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions during T2 and T3

Parameter	Unit	C	ell 1	Cel	12	Ce	ell 3
		T2	T3	T2	Т3	T2	T3
E-UTRA RF Channel			1	1		1	
Number			1	ı		•	
Correlation Matrix and		1x2	1x2 Low		Low	1x2	Low
Antenna Configuration							
OCNG patterns		OP	5 FDD	OP.6	FDD	OP.6	N/A
defined in A.3.2.1		01 .	3100	01.0	100	FDD	IN/A
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA	dB		0	0	1	0	N/A
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
OCNG_RA ^{Note 1}							
OCNG_RB ^{Note 1}							
PRS_RA	dB	-3	N/A	N/A	3	3	N/A
$N_{oc}^{ m Note 3}$	dBm/ 15 kHz	-98	-95	-98	-95	-98	-95
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$	dB	-1	-Infinity	-Infinity	-7	-7	-Infinity
PRS $\hat{E}_{s}/I_{ot}^{Note 4}$	dB	-1.79	-Infinity	-Infinity	-7	-9.54	-Infinity
lo Note 4	dBm/ 9 MHz	-69.55	-67.08	-69.55	-67.08	-69.55	N/A
PRP Note 4	dBm/ 15 kHz	-99	-Infinity	-Infinity	-102	-105	-Infinity
RSRP Note 4	dBm/ 15 kHz	-96	-93	-105	-105	-108	-Infinity
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 4}}$	dB	2	2	-7	-10	-10	-Infinity
Propagation Condition			<u>-</u>	ETU	30	·	·

Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period

Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: If PRS_RA is not "N/A", \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters and are given for information purpose. If PRS_RA is "N/A", Io and RSRP levels have been derived from other parameters and are given for information purpose. These are not settable test parameters. Interference conditions shall be applied to all PRS symbols of DL positioning subframes.

Table A.8.12.1.1-4: DRX parameters for the test of E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Field	Value	Comment
onDurationTimer	psf1	
Drx-InactivityTimer	psf1	As appoiling in
drx-RetransmissionTimer	sf1	As specified in TS 36.331 [2], Clause 6.3.2
longDRX-CycleStartOffset	sf320	13 30.331 [2], Clause 6.3.2
shortDRX	Disable	

A.8.12.1.2 Test Requirements

The RSTD measurement time fulfils the requirements specified in Clause 8.1.2.5.1.

The UE shall perform and report the RSTD measurements for Cell 2 and Cell 3 with respect to the reference cell in the OTDOA assistance data, Cell 1, within 2560 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Clause 9.1.10.3, i.e., between RSTD 0000 and RSTD 12711.

NOTE: The RSTD measurement time in the test is derived from the following expression, $T_{PRS}(M-1)+160\left|\frac{n}{M}\right|$, where

M=8 and n=16 are the parameters specified in Clause 8.1.2.5.1, Table 8.1.2.5.1-1, under Note 1. This gives the total RSTD measurement time of 2560 ms for Cell 2 and Cell 3 with respect to the reference cell Cell 1.

A.8.12.2 E-UTRAN TDD intra-frequency RSTD measurement reporting delay test case

A.8.12.2.1 Test Purpose and Environment

The purpose of the test is to verify that the RSTD measurement meets the requirements specified in Clause 8.1.2.5.2 in an environment with fading propagation conditions.

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the reference as well as the PCell. Cell 2 and Cell 3 are the neighbour cells. All cells are on the same RF channel.

The test consists of three consecutive time intervals, with duration of T1 and T2. Cell 1 is active in T1, T2 and T3, whilst Cell 2 and Cell 3 are activated only in the beginning of T2. Cell 2 is active until the end of T3, and Cell 3 is active until the end of T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the reference cell, where the PRS positioning occasion is as defined in Clause 8.1.2.5.1. Cell 1 transmits PRS in T2, while Cell 2 transmits PRS only in T3, and Cell 3 transmits PRS only in T2. Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

The test parameters are as given in Table A.8.12.2.1-1, Table A.8.12.2.1-2, Table A.8.12.2.1-3, and Table A.8.12.2.1-4.

Table A.8.12.2.1-1: General test parameters for E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Parameter	Unit	Value	Comment
Reference cell	Jill	Cell 1	Reference is the cell in the OTDOA assistance data with respect to which the RSTD measurement is defined, as specified in TS 36.214 [4] and TS 36.355 [24]. The reference cell is the PCell in this test case.
Neighbor cells		Cell 2 and Cell 3	Cell 2 and Cell 3 appear at random places in the neighbour cell list in the OTDOA assistance data, but Cell 2 always appears in the first half of the list, whilst Cell 3 appears in the second half of the list.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Channel Bandwidth (BW _{channel})	MHz	10	
PRS Transmission Bandwidth	RB	50	PRS are transmitted over the system bandwidth
PRS configuration index I_{PRS}		174	This corresponds to periodicity of 320 ms and PRS subframe offset of $I_{\rm PRS}-160$ DL subframes, as defined in TS 36.211 [16], Table 6.10.4.3-1
Number of consecutive downlink positioning subframes N_{PRS}		1	As defined in TS 36.211 [16]. The number of subframes in a positioning occasion
Physical cell ID PCI		(PCI of Cell 1 – PCI of Cell 2)mod6=0 and (PCI of Cell 1 – PCI of Cell 3)mod6=0	The cell PCIs are selected such that the relative shifts of PRS patterns among cells are as given by the test parameters
TDD uplink-downlink configuration		1	As specified in TS 36.211 [16], Clause 4.2; corresponds to a configuration with 5 ms switch-point periodicity and two downlink consecutive subframes
TDD special subframe configuration		6	As specified in TS 36.211 [16], Clause 4.2; corresponds to DwPTS of $19760 \cdot T_{\rm s}$ and UpPTS of $4384 \cdot T_{\rm s}$
CP length		Normal	The same CP length applies for DL and UL
DRX		ON	DRX parameters are further specified in Table A.8.12.2.1-3
Radio frame receive time offset between the cells at the UE antenna connector	μs	Cell 2 to Cell 1: 1 Cell 3 to Cell 1: -1	PRS are transmitted from synchronous cells
Expected RSTD	μs	Cell 2: 3 Cell 3: 3 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
Expected RSTD uncertainty for all neighbour cells	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
Number of cells provided in OTDOA assistance data		16	Including the reference cell
PRS muting info		Cell 1: '11110000' Cell 2: '00001111' Cell 3: '11110000'	Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	s	3	The length of the time interval from the beginning of each test
T2	s	1.28	The length of the time interval that follows immediately after time interval T1
Т3	s	1.28	The length of the time interval that follows immediately after time interval T2

Table A.8.12.2.1-2: Cell-specific test parameters for E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions during T1

Parameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel		1	1	1
Number		•	•	·
Correlation Matrix and		1x2 Low	1x2 Low	1x2 Low
Antenna Configuration				
OCNG patterns		OP.1 TDD	N/A	N/A
defined in A.3.2.2		OP.1 100	IN/A	IN/A
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA	dB	0	N/A	N/A
PHICH_RB				
PDCCH_RA				
PDCCH RB				
OCNG RA Note 1				
OCNG_RB Note 1				
	dBm/		0.5	•
$N_{oc}^{ m Note 3}$	15 kHz		-95	
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$	dB	-Infinity	-Infinity	-Infinity
		ппппу	ii ii ii ii ii y	ii ii ii ii y
lo Note 4	dBm/	-67.22	N/A	N/A
	9 MHz	01.22	14//1	14// (
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$	dB	0	-Infinity	-Infinity
Propagation Condition			ETU30	

- Note 1: OCNG shall be used such that active cell (Cell 1) is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 4: Io levels have been derived from other parameters and are given for information purpose. These are not settable test parameters.

Table A.8.12.2.1-3: Cell-specific test parameters for E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Parameter	Unit	Ce	II 1	Cel	1 2	Ce	ell 3
		T2	Т3	T2	Т3	T2	Т3
E-UTRA RF Channel			1	1			1
Number			-	_			
Correlation Matrix and		1x2	Low	1x2 L	_OW	1x2	Low
Antenna Configuration							
OCNG patterns		OP 1	TDD	OP.2	TDD	OP.2	N/A
defined in A.3.2.2		01.1	100	01 .2	100	TDD	14// (
PBCH_RA	 						
PBCH_RB	<u> </u>						
PSS_RA	<u> </u>						
SSS_RA	<u> </u>						
PCFICH_RB	<u> </u>						
PHICH_RA	dB	(0	0		0	N/A
PHICH_RB]						
PDCCH_RA	<u> </u>						
PDCCH_RB]						
OCNG_RA Note 1	<u> </u>						
OCNG_RB Note 1							
PRS_RA	dB	-3	N/A	N/A	3	3	N/A
$N_{oc}^{ m Note 3}$	dBm/ 15 kHz	-98	-95	-98	-95	-98	-95
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-1	-Infinity	-Infinity	-7	-7	-Infinity
PRS $\hat{E}_{_{s}}/I_{_{ot}}^{}$ Note 4	dB	-1.79	-Infinity	-Infinity	-7	-9.54	-Infinity
lo Note 4	dBm/ 9 MHz	-69.55	-67.08	-69.55	-67.08	-69.55	N/A
PRP Note 4	dBm/ 15 kHz	-99	-Infinity	-Infinity	-102	-105	-Infinity
RSRP Note 4	dBm/ 15 kHz	-96	-93	-105	-105	-108	-Infinity
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 4}}$	dB	2	2	-7	-10	-10	-Infinity
Propagation Condition		ETU30					

Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period

Note 3: Interference from other cells and noise sources not specified in the test and assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: If PRS_RA is not "N/A", \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters and are given for information purpose. If PRS_RA is "N/A", Io and RSRP levels have been derived from other parameters and are given for information purpose. These are not settable test parameters. Interference conditions shall be applied to all PRS symbols of DL positioning subframes.

Table A.8.12.2.1-4: DRX parameters for the test of E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Field	Value	Comment
onDurationTimer	psf1	
drx-InactivityTimer	psf1	As appoified in
drx-RetransmissionTimer	sf1	As specified in TS 36.331 [2], Clause 6.3.2.
longDRX-CycleStartOffset	sf320	13 30.331 [2], Clause 6.3.2.
shortDRX	disable	

A.8.12.2.2 Test Requirements

The RSTD measurement time fulfils the requirements specified in Clause 8.1.2.5.2.

The UE shall perform and report the RSTD measurements for Cell 2 and Cell 3 with respect to the reference cell in the OTDOA assistance data, Cell 1, within 2560 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Clause 9.1.10.3, i.e., between RSTD 0000 and RSTD 12711.

NOTE: The RSTD measurement time in the test is derived from the following expression, $T_{PRS}(M-1)+160\left[\frac{n}{M}\right]$,

where M =8 and n =16 are the parameters specified for this test case in Clause 8.1.2.5.2, Table 8.1.2.5.2-1, under Note 1. This gives the total RSTD measurement time of 2560 ms for Cell 2 and Cell 3 with respect to the reference cell Cell 1.

A.8.13 RSTD Inter-frequency Measurements

A.8.13.1 E-UTRAN FDD-FDD inter-frequency RSTD measurement reporting delay test case with the reference cell on the serving carrier frequency

A.8.13.1.1 Test Purpose and Environment

The purpose of the test is to verify that the FDD-FDD inter-frequency RSTD measurement meets the requirements specified in Clause 8.1.2.6.1, specifically for Note 2 in Table 8.1.2.6.1-1, in an environment with fading propagation conditions.

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the reference as well as the PCell. Cell 2 and Cell 3 are the neighbour cells. Cell 1 is on FDD RF channel 1. Cell 2 and Cell 3 are on a FDD RF channel 2.

The UE requires measurement gaps to perform inter-frequency measurements. Gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided and configured to not overlap with PRS subframes of Cell 1.

The test consists of three consecutive time intervals, with duration of T1, T2 and T3. Cell 1 is active in T1, T2 and T3, whilst Cell 2 and Cell 3 are activated only in the beginning of T2. Cell 2 is active until the end of T3, and Cell 3 is active until the end of T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the Cell 3, where the PRS positioning occasion is as defined in Clause 8.1.2.5.1. Cell 1 and Cell 3 transmit PRS only in T2. Cell 2 transmits PRS only in T3. Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data. The measurement gap configuration is known and configured in the UE at the start of T1. DRX is configured before T2.

The test parameters are as given in Table A.8.13.1.1-1, Table A.8.13.1.1-2, Table A.8.13.1.1-3 and Table A.8.13.1.1-4.

Table A.8.13.1.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency RSTD measurement reporting delay under fading propagation conditions

Parameter	Unit	Value	Comment
Reference cell		Cell 1	Reference cell is the cell with respect to which the RSTD measurement is defined, as specified in TS 36.214 [4]. The reference cell is the PCell on RF channel 1 in this test case.
Neighbor cells		Cell 2 and Cell 3	Cells on RF channel 2. The cells appear at random places in the neighbour cell list in the OTDOA assistance data, but Cell 2 always appears in the first half of the list, whilst Cell 3 appears in the second half of the list.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Channel Bandwidth (BW _{channel})	MHz	10	
PRS Bandwidth	RB	50	PRS bandwidth is as indicated in prs-Bandwidth in the OTDOA assistance data defined in [24]. Here, PRS are transmitted over the system bandwidth
Gap pattern Id		0	As specified in Table 8.1.2.1-1. Applies for measurements on Cell 2 and Cell 3
Gap offset		9	As specified in TS 36.331 [2], Clause 6.3.5
PRS configuration index I_{PRS}		Cell 1: 181, Cell 2, Cell 3: 171	This corresponds to periodicity of 320 ms and PRS subframe offset of $I_{\rm PRS}$ -160 DL subframes, as defined in TS 36.211 [16], Table 6.10.4.3-1
Number of consecutive downlink positioning subframes N_{PRS}		1	As defined in TS 36.211 [16]. The number of subframes in a positioning occasion
Physical cell ID PCI		(PCI of Cell 1 – PCI of Cell 2)mod6=0 and (PCI of Cell 1 – PCI of Cell 3)mod6=0	The cell PCIs are selected such that the relative shifts of PRS patterns among cells are as given by the test parameters
CP length		Normal	
DRX		ON	DRX parameters are further specified in Table A.8.13.1.1-3.
prs-SubframeOffset		310	Number of subframes rounded to the closest integer. The corresponding parameter in the OTDOA assistance data is prs- SubframeOffset specified in TS 36.355 [24]
slotNumberOffset		0	The slot number offset at the transmitter between a neighbour cell and the assistance data reference cell specified in TS 36.355 [24]
Radio frame receive time offset between the cells at the UE antenna connector	μs	Cell 2 to Cell 1: 1 Cell 3 to Cell 1: -1	PRS are transmitted from synchronous cells
Expected RSTD	μs	Cell 2: -2 Cell 3: 2 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator

Expected RSTD uncertainty for all neighbour cells	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
Number of cells provided in OTDOA assistance data		16	The list includes the reference cell (received in <i>OTDOA-ReferenceCellInfo</i> [24]) on RF channel 1 and 15 other cells on RF channel 2, all received in <i>OTDOA-ProvideAssistanceData</i> [24].
PRS muting info		Cell 1: '1111111100000000' Cell 2: '000000011111111' Cell 3: '1111111100000000'	Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	S	3	The length of the time interval from the beginning of each test
T2	S	2.48	The length of the time interval that follows immediately after time interval T1
ТЗ	S	2.48	The length of the time interval that follows immediately after time interval T2

Table A.8.13.1.1-2: Cell-specific test parameters for E-UTRAN FDD-FDD inter-frequency RSTD measurement reporting delay under fading propagation conditions during T1

Parameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel		1	N/A	N/A
Number		ı	IV/A	IN/A
Correlation Matrix and		1x2 Low	1x2 Low	1x2 Low
Antenna Configuration				
OCNG patterns		OP.5 FDD	N/A	N/A
defined in A.3.2.1		OF.5 FDD	IN/A	IN/A
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA	dB	0	N/A	N/A
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA ^{Note 1}				
OCNG_RB ^{Note 1}				
$N_{oc}^{ m Note 3}$	dBm/	-95	N/A	N/A
00	15 kHz			-
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$	dB	-Infinity	-Infinity	-Infinity
lo Note 4	dBm/	-67.22	N/A	N/A
	9 MHz	J. ILL	. 37 (// (
$\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$	dB	0	-Infinity	-Infinity
Propagation Condition			ETU30	

- Note 1: OCNG shall be used such that the active cell (Cell 1) is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\rm eff}$ to be fulfilled.
- Note 4: lo levels have been derived from other parameters and are given for information purpose. These are not settable test parameters.

Table A.8.13.1.1-3: Cell-specific test parameters for E-UTRAN FDD-FDD inter-frequency RSTD measurement reporting delay under fading propagation conditions during T2 and T3

Parameter	Unit	C	ell 1	Cel	I 2	Ce	II 3
		T2	T3	T2	T3	T2	T3
E-UTRA RF Channel			1	2	1	2	N/A
Number							
Correlation Matrix and		1x2	2 Low	1x2	Low	1x2	Low
Antenna Configuration							
OCNG patterns		OP	5 FDD	OP.6	FDD	OP.6 FDD	N/A
defined in A.3.2.1		0		00		01.01.22	. 4,7 (
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA	dB		0	C)	0	N/A
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
OCNG_RA ^{Note 1}							
OCNG_RB ^{Note 1}							
PRS_RA	dB	-3	N/A	N/A	3	3	N/A
$N_{oc}^{ m Note~3}$	dBm/ 15 kHz	-98	-98	-98	-95	-98	N/A
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-1	-Infinity	-Infinity	-7	-8	-Infinity
PRS $\hat{E}_{s}/I_{ot}^{Note 4}$	dB	-1	-Infinity	-Infinity	-7	-8	-Infinity
lo Note 4	dBm/ 9 MHz	-69.68	-70.22	-70.11	-67.08	-70.11	N/A
PRP Note 4	dBm/ 15 kHz	-99	-Infinity	-Infinity	-102	-106	-Infinity
RSRP Note 4	dBm/ 15 kHz	-96	-96	-105	-105	-109	-Infinity
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 4}}$	dB	2	2	-7	-10	-11	-Infinity
Propagation Condition		ETU30					

Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period

Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: If PRS_RA is not "N/A", \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters and are given for information purpose. If PRS_RA is "N/A", Io and RSRP levels have been derived from other parameters and are given for information purpose. These are not settable test parameters. Interference conditions shall be applied to all PRS symbols of DL positioning subframes

Table A.8.13.1.1-4: DRX parameters for the test of E-UTRAN FDD-FDD inter-frequency RSTD measurement reporting delay under fading propagation conditions

Field	Value	Comment
onDurationTimer	psf1	
Drx-InactivityTimer	psf1	As appoiling in
drx-RetransmissionTimer	sf1	As specified in TS 36.331 [2], Clause 6.3.2
longDRX-CycleStartOffset	sf320	13 30.331 [2], Clause 6.3.2
shortDRX	Disable	

A.8.13.1.2 Test Requirements

The RSTD measurement time fulfils the requirements specified in Clause 8.1.2.6.1.

The UE shall perform and report the RSTD measurements for Cell 2 and Cell 3 with respect to the reference cell Cell 1 within 4960 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Clause 9.1.10.3, i.e., between RSTD 0000 and RSTD 12711.

NOTE: The RSTD measurement time in the test is derived from the following expression, $T_{PRS}(M-1)+160\left[\frac{n}{M}\right]$,

where M = 16 and n = 16 are the parameters specified in Clause 8.1.2.6.1, Table 8.1.2.6.1-1, under Note 2. This gives the total RSTD measurement time of 4960 ms for Cell 2 and Cell 3 with respect to the reference cell Cell 1.

A.8.13.2 E-UTRAN TDD-TDD inter-frequency RSTD measurement reporting delay test case with the reference cell on the serving carrier frequency

A.8.13.2.1 Test Purpose and Environment

The purpose of the test is to verify that the TDD-TDD inter-frequency RSTD measurement meets the requirements specified in Clause 8.1.2.6.3, specifically for Note 2 in Table 8.1.2.6.3-1, in an environment with fading propagation conditions.

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the reference as well as the PCell. Cell 2 and Cell 3 are the neighbour cells. Cell 1 is on TDD RF channel 1. Cell 2 and Cell 3 are on TDD RF channel 2.

The UE requires measurement gaps to perform inter-frequency measurements. Gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided and configured to not overlap with PRS subframes of Cell 1.

The test consists of three consecutive time intervals, with duration of T1 and T2. Cell 1 is active in T1, T2 and T3, whilst Cell 2 and Cell 3 are activated only in the beginning of T2. Cell 2 is active until the end of T3, and Cell 3 is active until the end of T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the Cell 3, where the PRS positioning occasion is as defined in Clause 8.1.2.5.1. Cell 1 and Cell 3 transmit PRS only in T2. Cell 2 transmits PRS only in T3. Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data. The measurement gap configuration is known and configured in the UE at the start of T1. DRX is configured before T2.

The test parameters are as given in Table A.8.13.2.1-1, Table A.8.13.2.1-2, Table A.8.13.2.1-3, and Table A.8.13.2.1-4.

Table A.8.13.2.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency RSTD measurement reporting delay under fading propagation conditions

Parameter	Unit	Value	Comment
Reference cell		Cell 1	Reference cell is the cell with respect to which the RSTD measurement is defined, as specified in TS 36.214 [4]. The reference cell is the PCell on RF channel 1 in this test case.
Neighbor cells		Cell 2 and Cell 3	Cells on RF channel 2. The cells appear at random places in the neighbour cell list in the OTDOA assistance data, but Cell 2 always appears in the first half of the list, whilst Cell 3 appears in the second half of the list.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Channel Bandwidth (BW _{channel})	MHz	10	
PRS Bandwidth	RB	50	PRS bandwidth is as indicated in prs- Bandwidth in the OTDOA assistance data defined in [24]. Here, PRS are transmitted over the system bandwidth
Gap pattern Id		0	As specified in Table 8.1.2.1-1. Applies for measurements on Cell 2 and Cell 3
Gap offset		12	As specified in TS 36.331 [2], Clause 6.3.5
PRS configuration index $I_{ m PRS}$		Cell 1: 184, Cell 2, Cell 3: 174	This corresponds to periodicity of 320 ms and PRS subframe offset of $I_{\rm PRS}-160$ DL subframes, as defined in TS 36.211 [16], Table 6.10.4.3-1
Number of consecutive downlink positioning subframes N_{PRS}		1	As defined in TS 36.211 [16]. The number of subframes in a positioning occasion
Physical cell ID PCI		(PCI of Cell 1 – PCI of Cell 2)mod6=0 and (PCI of Cell 1 – PCI of Cell 3)mod6=0	The cell PCIs are selected such that the relative shifts of PRS patterns among cells are as given by the test parameters
TDD uplink-downlink configuration		1	As specified in TS 36.211 [16], Clause 4.2; corresponds to a configuration with 5 ms switch-point periodicity and two downlink consecutive subframes
TDD special subframe configuration		6	As specified in TS 36.211 [16], Clause 4.2; corresponds to DwPTS of $19760 \cdot T_{\rm s}$ and UpPTS of $4384 \cdot T_{\rm s}$
CP length		Normal	The same CP length for DL and UL
DRX		ON	DRX parameters are further specified in Table A.8.13.2.1-3.
prs-SubframeOffset		310	Number of subframes rounded to the closest integer. The corresponding parameter in the OTDOA assistance data is prs-SubframeOffset specified in TS 36.355 [24]
slotNumberOffset		0	The slot number offset at the transmitter between a neighbour cell and the assistance data reference cell specified in TS 36.355 [24]
Radio frame receivetime offset between the cells at the UE antenna connecto	μs	Cell 2 to Cell 1: 1 Cell 3 to Cell 1: -1	PRS are transmitted from synchronous cells
Expected RSTD	μs	Cell 2: -2 Cell 3: 2 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
Expected RSTD uncertainty for all neighbour cells	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index

Number of cells provided in OTDOA assistance data		16	The list includes the reference cell (received in OTDOA-ReferenceCellInfo [24]) on RF channel 1 and 15 other cells on RF channel 2, all received in OTDOA-ProvideAssistanceData [24].
PRS muting info		Cell 1: '1111111100000000' Cell 2: '000000011111111' Cell 3: '1111111100000000'	Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	s	3	The length of the time interval from the beginning of each test
T2	s	2.48	The length of the time interval that follows immediately after time interval T1
Т3	s	2.48	The length of the time interval that follows immediately after time interval T2

Table A.8.13.2.1-2: Cell-specific test parameters for E-UTRAN TDD-TDD inter-frequency RSTD measurement reporting delay under fading propagation conditions during T1

Parameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number		1 N/A		N/A
Correlation Matrix and Antenna Configuration		1x2 Low	1x2 Low	1x2 Low
OCNG patterns defined in A.3.2.2		OP.1 TDD	N/A	N/A
PBCH_RA PBCH_RB				
PSS_RA SSS_RA				
PCFICH_RB PHICH_RA	dB	0	N/A	N/A
PHICH_RB PDCCH_RA				
PDCCH_RB OCNG_RA ^{Note 1} OCNG_RB ^{Note 1}				
N_{oc} Note 3	dBm/ 15 kHz	-95	N/A	N/A
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$	dB	-Infinity	-Infinity	-Infinity
Io Note 4	dBm/ 9 MHz	-67.22	N/A	N/A
\hat{E}_{s}/N_{oc}	dB	0	-Infinity	-Infinity
Propagation Condition			ETU30	

- Note 1: OCNG shall be used such that the active cell (Cell 1) is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period
- Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 4: lo levels have been derived from other parameters and are given for information purpose. These are not settable test parameters.

Table A.8.13.2.1-3: Cell-specific test parameters for E-UTRAN TDD-TDD inter-frequency RSTD measurement reporting delay under fading propagation conditions

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2	Т3	T2	T3	T2	T3
E-UTRA RF Channel			1	,)	2	N/A
Number				2		2	IN/A
Correlation Matrix and		1x2 Low		1x2 Low		1x2 Low	
Antenna Configuration							
OCNG patterns		OP.1 TDD		OP.2 TDD		OP.2 TDD	N/A
defined in A.3.2.2		01 .	1 100	01 .2		01 .2 100	14// (
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA	dB		0	()	0	N/A
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
OCNG_RA ^{Note 1}							
OCNG_RB ^{Note 1}							
PRS_RA	dB	-3	N/A	N/A	3	3	N/A
$N_{oc}^{ m Note 3}$	dBm/ 15 kHz	-98	-98	-98	-95	-98	N/A
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-1	-Infinity	-Infinity	-7	-8	-Infinity
PRS $\hat{E}_{_{s}}/I_{_{ot}}^{}$ Note 4	dB	-1	-Infinity	-Infinity	-7	-8	-Infinity
lo Note 4	dBm/ 9 MHz	-69.68	-70.22	-70.11	-67.08	-70.11	N/A
PRP Note 4	dBm/ 15 kHz	-99	-Infinity	-Infinity	-102	-106	-Infinity
RSRP Note 4	dBm/ 15 kHz	-96	-96	-105	-105	-109	-Infinity
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 4}}$	dB	2	2	-7	-10	-11	-Infinity
Propagation Condition		ETU30					

Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test and assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\rm acc}$ to be fulfilled.

Note 4: If PRS_RA is not "N/A", \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters and are given for information purpose. If PRS_RA is "N/A", Io and RSRP levels have been derived from other parameters and are given for information purpose. These are not settable test parameters. Interference conditions shall be applied to all PRS symbols of DL positioning subframes.

Table A.8.13.2.1-4: DRX parameters for the test of E-UTRAN TDD-TDD inter-frequency RSTD measurement reporting delay under fading propagation conditions

		•
Field	Value	Comment
onDurationTimer	psf1	
drx-InactivityTimer	psf1	A consolition in
drx-RetransmissionTimer	sf1	As specified in TS 36.331 [2], Clause 6.3.2.
longDRX-CycleStartOffset	sf320	13 30.331 [2], Clause 6.3.2.
shortDRX	disable	

A.8.13.2.2 Test Requirements

The RSTD measurement time fulfils the requirements specified in Clause 8.1.2.6.3.

The UE shall perform and report the RSTD measurements for Cell 2 and Cell 3 with respect to the reference cell Cell 1 within 4960 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Clause 9.1.10.3, i.e., between RSTD 0000 and RSTD 12711.

NOTE: The RSTD measurement time in the test is derived from the following expression, $T_{PRS}(M-1)+160\left[\frac{n}{M}\right]$,

where M = 16 and n = 16 are the parameters specified in Clause 8.1.2.6.3, Table 8.1.2.6.3-1, under Note 2. This gives the total RSTD measurement time of 4960 ms for Cell 2 and Cell 3 with respect to the reference cell Cell 1.

A.8.14 E-UTRAN TDD - FDD Inter-frequency Measurements

A.8.14.1 E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

A.8.14.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD-FDD interfrequency cell search requirements in clause 8.1.2.3.3.

The test parameters are given in Tables A.8.14.1.1-1 and A.8.14.1.1-2. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.14.1.1-1: General test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
Cell 1 PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
Cell 1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Cell1 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
Cell1 Uplink-downlink configuration		1	As specified in TS 36.211 clause 4.2 Table 4.2-2.
Cell 2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Cell 1 E-UTRA TDD RF Channel Number		1	One TDD carrier frequency is used.
Cell 2 E-UTRA FDD RF Channel Number		2	One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	ÖFF
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	·
T2	S	5	

Table A.8.14.1.1-2: Cell specific test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		C	ell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		1			2	
Number						
BW _{channel}	MHz	10	0		10	
Correlation Matrix and		1x2	Low	1x2	2 Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.2.1		OP.1	TDD	OP.	2 FDD	
(OP.1 TDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB			0		
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	C				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~3}$	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4 4		-Infinity	7	
Propagation Condition	ETU70					
	e used such that bo			constant total tra	nsmitted power	
spectral densi	ty is achieved for all	OFDM symbols	<u>-</u>			
Note 2: The resources	for unlink transmiss	eion are accione	d to the LIE prid	or to the start of tir	me period T2	

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant

over subcarriers and time and shall be modelled as AWGN of appropriate power for $\,N_{oc}\,$ to be fulfilled

fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.14.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

A.8.14.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These test will partly verify the TDD-FDD inter-frequency cell search requirements when DRX is used in clause 8.1.2.3.

The common test parameters are given in Tables A.8.14.2.1-1 and A.8.14.2.1-2. DRX configuration for Test1 and Test2 are given in Table A.8.14.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.14.2.1-4. In these tests, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignmend. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.14.2.1-1: General test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Va	lue	
Cell1 PDSCH parameters		DL Reference Me	asurement	As specified in clause A.3.1.1.2. Note that
· ·		Channel R.0 TDD		UE may only be allocated at On Duration
Cell1PCFICH/PDCCH/PHIC		DL Reference Me		As specified in clause A.3.1.2.2.
H parameters		Channel R.6 TDD)	
Cell2 PDSCH parameters		DL Reference Me	asurement	As specified in clause A.3.1.1.1. Note that
		Channel R.0 FDD)	UE may only be allocated at On Duration
Cell2PCFICH/PDCCH/PHIC		DL Reference Me		As specified in clause A.3.1.2.1.
H parameters		Channel R.6 FDD)	
E-UTRA RF Channel		1		one TDD carrier frequencies is used.
Number				
E-UTRA RF Channel		2	2	one FDD carrier frequencies is used.
Number				
Channel Bandwidth	MHz	1	0	
(BW _{channel})				
Active cell		Ce	II 1	Cell 1 is on RF channel number 1
Neighbour cell		Ce	II 2	Cell 2 is on RF channel number 2
Gap Pattern Id		()	As specified in TS 36.133 clause 8.1.2.1.
Cell1 Uplink-downlink		,		As specified in TS 36.211 clause 4.2 Table
configuration				4.2-2
Cell1 Special subframe		(6	As specified in table 4.2-1 in TS 36.211.
configuration				The same configuration in both cells
A3-Offset	dB	-		
Hysteresis	dB	()	
CP length		Nor	mal	
TimeToTrigger	S	()	
Filter coefficient		()	L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-3 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access
_				procedure.
DRX		ON		DRX related parameters are defined in
				Table A.8.14.2.1-3
Time offset between cells		3 r	ns	Asynchronous cells
T1	S		5	
T2	S	5	30	

Table A.8.14.2.1-2: Cell specific test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		C	Cell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel			1		2		
Number							
BW _{channel}	MHz	,	10		10		
Correlation Matrix and		1x2	Low	1x	2 Low		
Antenna Configuration							
OCNG Patterns							
defined in A.3.2.2.1		OP.1	TDD	OP	.2 FDD		
(OP.1 TDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		_				
PHICH_RB	dB		0	0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{ m Note~2}$	dBm/15 kHz			-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7		
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7		
Propagation Condition		ETU70					

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

Table A.8.14.2.1-3: drx-Configuration to be used in E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
rieiu	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.8.14.2.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
rieid	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see clause 6.3.2 in TS 36.331.
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and 10.1 in TS 36.213.

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

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

A.8.14.2.2 Test Requirements

In Test1 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 20*1280ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report

A.8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

A.8.14.3.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.3.6.

The test scenario comprises of one E-UTRA FDD carriers and one cell on each carrier as given in tables A.8.14.3.1-1 and A.8.14.3.1-2. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE. Measurement gaps shall be deconfigured before the start of T3.

Table A.8.14.3.1-1: General test parameters for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
Cell1PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.2
		Channel R.0 TDD	
Cell1 PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2
parameters		Channel R.6 TDD	
Cell2 PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.1
		Channel R.0 FDD	
Cell2 PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1
parameters		Channel R.6 FDD	
Cell1 E-UTRA RF channel number		1	One TDD carrier is used
Cell2 E-UTRA RF channel number		2	One FDD carrier is used
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Cell1 special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
Cell1 Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	ms	3	Asynchronous cells
T1	S	5	
T2	s	≤10	
T3	s	5	

Table A.8.14.3.1-2: Cell specific test parameters for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit		Cell 1			Cell 2		
		T1	T2	T3	T1	T2	Т3	
E-UTRA RF Channel Number			1		2			
BW _{channel}	MHz		10			10		
OCNG Patterns defined in		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2	OP.2 FDD	OP.2 FDD	
A.3.2.2.1 (OP.1 TDD) and in					FDD			
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB		0			0		
PHICH_PB	dB							
PDCCH_RA	dB							
PDCCH_PB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
\hat{E}_{s}/I_{ot}	dB	4	4	4	-Infinity	7	7	
N _{oc} Note 2	dBm/15 KHz	-98						
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7	
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91	
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91	
Propagation Condition				AW	GN			

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

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

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

A.8.14.3.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

 $Test \ requirement = RRC \ Procedure \ delay + \ T_{identify_CGI, inter} + reporting \ delay$

= 15 + 150 + 2ms from the start of T3

= 167 ms, allow 170 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall 42 ACK/NACK number is caused by two parts. Firstly, at least 30 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.1.2.3.7.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional 12 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

A.8.15 E-UTRAN FDD - TDD Inter-frequency Measurements

A.8.15.1 E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

A.8.15.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD-TDD interfrequency cell search requirements in clause 8.1.2.3.4.

The test parameters are given in Table A.8.15.1.1-1 and A.8.15.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.15.1.1-1: General test parameters for E-UTRAN FDD-TDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
		DL Reference Measurement	
Cell 1 PDSCH parameters		Channel R.0 FDD	As specified in clause A.3.1.1.1
Cell 1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Cell 2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Cell2 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. Applicable to Cell 2.
Cell2 Uplink-downlink configuration		1	As specified in TS 36.211 clause 4.2 Table 4.2-2. Applicable to Cell 2.
CP length		Normal	
Cell 1 E-UTRA FDD RF Channel Number		1	One TDD carrier frequency is used.
Cell 2 E-UTRA TDD RF Channel Number		2	One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	S	10	

Table A.8.15.1.1-2: Cell specific test parameters for E-UTRAN FDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Ce	Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1	2	2	
Number						
BW _{channel}	MHz	1	0	1	0	
Correlation Matrix and		1x2	Low	1x2	Low	
Antenna Configuration						
OCNG Pattern defined						
n A.3.2.1.1 (OP.1		OP.1	FDD	OP.2	TDD	
FDD) and in A.3.2.2.2						
(OP.2 TDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB		_			
PHICH_RB	dB	()	0		
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
DCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	
$N_{oc}^{ m Note~3}$	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
Propagation Condition	ETU70					
	e used such that bot	h cells are fully	allocated and a	constant total tran	smitted power	
	ty is achieved for all			ori to the start of tim	no poriod T2	

Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be

fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.15.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCC

A.8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

A.8.15.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the FDD-TDD inter-frequency cell search requirements when DRX is used in clause 8.1.2.3.4.

The common test parameters are given in Tables A.8.15.2.1-1 and A.8.15.2.1-2. DRX configuration for Test1 and Test2 are given in Table A.8.15.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.15.2.1-4. In these tests, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.15.2.1-1: General test parameters for E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

Parameter	Unit	Test 1	Test 2	Comment
		Va	lue	
Cell 1 PDSCH parameters		DL Reference Me	asurement	As specified in clause A.3.1.1.1 Note that
		Channel R.0 FDE		UE may only be allocated at On Duration
Cell 1		DL Reference Me	asurement	As specified in clause A.3.1.2.1.
PCFICH/PDCCH/PHICH		Channel R.6 FDE)	
parameters				
Cell 2 PDSCH parameters		DL Reference Me		As specified in clause A.3.1.1.2 Note that
		Channel R.0 TDD		UE may only be allocated at On Duration
Cell 2		DL Reference Me		As specified in clause A.3.1.2.2.
PCFICH/PDCCH/PHICH		Channel R.6 TDD)	
parameters				
Cell 1 E-UTRA FDD RF		·		One FDD carrier frequency is used.
Channel Number				
Cell 2 E-UTRA TDD RF		2	2	One TDD carrier frequency is used.
Channel Number				
Channel Bandwidth	MHz	1	0	
(BW _{channel})		_		
Active cell		Ce		Cell 1 is on RF channel number 1
Neighbour cell			II 2	Cell 2 is on RF channel number 2
Gap Pattern Id		(As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-		
Hysteresis	dB)	
CP length		Nor		
TimeToTrigger	S)	
Filter coefficient)	L3 filtering is not used
E-UTRA FDD PRACH		4	1	As specified in table 5.7.1-2 in TS 36.211
configuration				
Cell 2 Special subframe		(6	As specified in table 4.2-1 in TS 36.211
configuration				
Cell 2 Uplink-downlink		,		As specified in table 4.2-2 in TS 36.211
configuration				
E-UTRA TDD Access	-	Not Sent		No additional delays in random access
Barring Information				procedure.
DRX		ON		DRX related parameters are defined in
				Table A.8.15.2.1-3
Time offset between cells	ms	;		Asynchronous cells
T1	S		5	
T2	S	5	30	

Table A.8.15.2.1-2: Cell specific test parameters for E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1			Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		,	1		2	
Number						
BW _{channel}	MHz	1	0		10	
Correlation Matrix and		1x2	Low	1>	(2 Low	
Antenna Configuration						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OP	2.2 TDD	
(OP.1 FDD) and in						
A.3.2.2.2 (OP.2 TDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB		2			
PHICH_RB	dB		0	0		
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~2}$	dBm/15 kHz			-98		
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4			7	
Propagation Condition			E	TU70		

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

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

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

Table A.8.15.2.1-3: drx-Configuration to be used in E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

Field	Test1	Test2	Comment			
Field	Value	Value				
onDurationTimer	psf1	psf1				
drx-InactivityTimer	psf1	psf1				
drx-RetransmissionTimer	psf1	psf1				
longDRX-CycleStartOffset	sf40	sf1280				
shortDRX	disable	disable				
Note: For further information see clause 6.3.2 in TS 36.331.						

Table A.8.15.2.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

Field	Test1	Test2	Comment
rieid	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see clause 6.3.2 in TS 36.331.
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

A.8.15.2.2 Test Requirements

In Test1 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 20*1280ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

A.8.15.3.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in clause 8.1.2.3.8.

The test scenario comprises of one E-UTRA FDD carrier and one E-UTRA TDD carrier and one cell on each carrier as given in tables A.8.15.3-1 and A.8.15.3-2. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE. Measurement gaps shall be deconfigured before the start of T3.

Table A.8.15.3-1: General test parameters for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
Cell1 PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in clause A.3.1.1.1
Cell1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Cell2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
E-UTRA RF channel number		1, 2	One FDD and one TDD carrier frequency are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Cell 2 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
Cell 2 Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211.
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

Table A.8.15.3-2: Cell specific test parameters for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number			1			2	
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.10	OP.10	OP.10	OP.2	OP.2 TDD	OP.2 TDD
A.3.2.1.10 (OP.10 FDD) and		FDD	FDD	FDD	TDD		
in A.3.2.2.1 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB		•				
PHICH_RA	dB		0			0	
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	4	4	4	-Infinity	7	7
$N_{oc}^{ m Note 2}$	dBm/15 KHz			-(98		
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition				AW	/GN		

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

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

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

A.8.15.3.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

 $Test\ requirement = RRC\ Procedure\ delay +\ T_{identify_CGI,inter} + reporting\ delay$

= 15 + 150 + 2ms from the start of T3

= 167 ms, allow 170 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 60 ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall 80 ACK/NACK number is caused by two parts. Firstly, at least 60 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.1.2.3.5.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional 20 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

A.8.16 E-UTRAN Carrier Aggregation Measurements

A.8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX

A.8.16.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1.

The test parameters are given in Tables A.8.16.1.1-1 and A.8.16.1.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

Table A.8.16.1.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Comment			
As specified in clause A.3.1.1.1			
As specified in clause A.3.1.2.1			
Two radio channels are used for this test			
Primary cell on RF channel number 1.			
Configured deactivated secondary cell on RF channel number 2.			
Neighbor cell to be identified on RF channel number 2.			
Channel bandwidth for cells on primary and secondary component carriers			
,			
Continuous monitoring of primary cell			
Hysteresis for evaluation of event A2.			
Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.			
Hysteresis for evaluation of event A6.			
Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.			
-			
Individual offset for cells on primary component carrier.			
Individual offset for cells on secondary component carrier.			
L3 filtering is not used			
•			
The value of time alignment error depends upon the type of carrier aggregation.			
Synchronous cells			
During this time the UE shall be aware of cells 1 and 2 but not cell 3.			
UE shall report Event A6 within 6.4s (20xscellMeasCycle)			
UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively. nnel bandwidth and is performed according			
Ul ar			

NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.1.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit		Cell 1		Cell 2			Cell 3		
		T1	T2	T3	T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel			1		2			2		
Number			ı			2				
BW _{channel}	MHz		10			10			10	
Correlation Matrix and			1x2 Low			1x2 Low		,	1x2 Low	
Antenna Configuration										
OCNG Patterns										
defined in A.3.2.1.1			OP.1 FDD		(OP.2 FDD		0	P.2 FDD	
(OP.1 FDD) and in										
A.3.2.1.2 (OP.2 FDD)										
PBCH_RA	dB									
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB		0		0			0		
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA ^{Note 1}	dB									
OCNG_RB ^{Note 1}	dB									
N _{oc} Note 2	dBm/15 kHz		-101				-10)1		
RSRP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104
Ê _s /I _{ot}	dB	19	19	-3	19	-0.05	-4.76	-infinity	-0.05	-4.76
SCH_RP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104
Ê _s /N _{oc}	dB	19	19	19 -3 19 19 -3			-3	-infinity 19 -3		
Propagation Condition						ETU70				

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

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

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

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

A.8.16.1.2 Test Requirements

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6.4s (20×measCycleSCell) from the beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 200 ms from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1.6s ($5 \times$ measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to 2×TTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX

A.8.16.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1.

The test parameters are given in Tables A.8.16.2.1-1 and A.8.16.2.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

Table A.8.16.2.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

	Parameter	Unit	Value	Comment
PDS	CH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
	RA RF Channel		1, 2	Two radio channels are used for this test
	e PCell		Cell 1	Primary cell on RF channel number 1.
	igured deactivated		Cell 2	Configured deactivated secondary cell on RF channel number 2.
	hbour cell		Cell 3	Neighbor cell to be identified on RF channel number 2.
	nnel Bandwidth	MHz	10	Channel bandwidth for cells on primary and secondary component carriers
	ength		Normal	and decondary compension camers
Spec	cial subframe guration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplin	ık-downlink guration		1	
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.
	Time To Trigger	S	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	individual offset for cells F channel number 1	dB	0	Individual offset for cells on primary component carrier.
	individual offset for cells F channel number 2	dB	0	Individual offset for cells on secondary component carrier.
	coefficient		0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
Cell2	timing offset to cell1	μs	0	
Time alignment error between cell2 and cell1		μs	≤ Time alignment error as specified in TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		μs	3	Synchronous cells
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×scellMeasCycle)
T3 s			5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.

NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.2.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit		Cell 1		Cell 2			Cell 3		
		T1	T2	Т3	T1 T2 T3		T1	T2	T3	
E-UTRA RF Channel			1		2		2			
Number			l l					2		
BW _{channel}	MHz		10			10			10	
Correlation Matrix and			1x2 Low			1x2 Low		·	1x2 Low	
Antenna Configuration										
OCNG Patterns										
defined in A.3.2.2.1		(OP.1 TDD		(OP.2 TDD		0	P.2 TDD	
(OP.1 TDD) and in										
A.3.2.2.2 (OP.2 TDD)										
PBCH_RA	dB									
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB							_		
PHICH_RB	dB		0		0			0		
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RANote 1	dB									
OCNG_RB ^{Note 1}	dB									
N _{oc} Note 2	dBm/15 kHz		-101				-10	1		
RSRP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104
Ê _s /I _{ot}	dB	19	19	-3	19	-0.05	-4.76	-infinity	-0.05	-4.76
SCH_RP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104
Ê _s /N _{oc}	dB	19	19	-3	19 19 -3			-infinity 19 -3		
Propagation Condition						ETU70				

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

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

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

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

A.8.16.2.2 Test Requirements

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6.4s ($20 \times$ measCycleSCell) from the beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 200 ms from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1.6s ($5 \times$ measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

A.8.16.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

The test parameters are given in Table A.8.16.3.1-1 and A.8.16.3.1-2 below. In the test there are three synchronous cells: Cell1, Cell2 and Cell3. Cell1 is PCell, Cell2 is deactivated SCell, and Cell3 is the neighbour cell. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with duration of T1 and T2, respectively. During T1 the UE shall not have any information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. PDCCH indicating a new transmission on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

Table A.8.16.3.1-1: General test parameters for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.3 FDD	As specified in clause A.3.1.1.1
	ICH/PDCCH/PHICH meters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
E-U7 Num	RA RF Channel ber		1, 2	Two radio channels are used for this test
Activ	e PCell		Cell 1	Primary cell on RF channel number 1.
Conf SCe	igured deactivated I		Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neig	hbour cell		Cell 3	Neighbor cell to be identified on RF channel number 2.
	nnel Bandwidth	MHz	10	Channel bandwidth for cells on primary and secondary component carriers
	ength		Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	individual offset for cells F channel number 1	dB	0	Individual offset for cells on primary component carrier.
on R	individual offset for cells F channel number 2	dB	0	Individual offset for cells on secondary component carrier.
	coefficient		0	L3 filtering is not used
SCe	I measurement cycle	ms	1280	
Cell2	timing offset to cell1	μs	0	
Time alignment error between cell2 and cell1		μs	≤ Time alignment error as specified in TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell	timing offset to cell1	μs	3	Synchronous cells
T1			5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		S	≤30	UE shall report Event A6 within 25.6s (20xscellMeasCycle)
NOT	E: This test verifies the	e RRM red	quirement which is independent of o	channel bandwidth and is performed according

NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter	Unit	Се	II 1	Ce	ell 2	Ce	II 3	
		T1	T2	T1	T2	T1	T2	
E-UTRA RF Channel		•	1		2		2	
Number								
BW _{channel}	MHz	1	0	,	10	1	0	
OCNG Pattern defined								
in A.3.2.1.10 (OP.10		OP.10) FDD	OP.2	2 FDD	OP.2	FDD	
FDD) and in A.3.2.1.2								
(OP.2)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB					0		
PHICH_RA	dB							
PHICH_RB	dB	(0		0			
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH RB	dB							
OCNG RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
N_{oc} Note 3	dBm/15 kHz			-	98			
RSRP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82	
\hat{E}_{s}/I_{ot}	dB	16	16	16	-0.11	-Infinity	-0.11	
SCH_RP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82	
\hat{E}_s/N_{oc}	dB	16	16	16	16	-Infinity	16	
Propagation Condition			•	AV	/GN	•	•	

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

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.16.3.2 Test Requirements

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25.6s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

A.8.16.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

The test parameters are given in Table A.8.16.4.1-1 and A.8.16.4.1-2 below. In the test there are three synchronous cells: Cell1, Cell2 and Cell3. Cell1 is PCell, Cell2 is deactivated SCell, and Cell3 is the neighbour cell. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with duration of T1 and T2, respectively. During T1 the UE shall not have any information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. PDCCH indicating a new transmission on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

Table A.8.16.4.1-1: General test parameters for E-UTRAN TDD-TDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

	Parameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
	RA RF Channel		1, 2	Two radio channels are used for this test
	e PCell		Cell 1	Primary cell on RF channel number 1.
	gured deactivated		Cell 2	Configured deactivated secondary cell on RF channel number 2.
	nbour cell		Cell 3	Neighbor cell to be identified on RF channel number 2.
Chan (BW _c	nel Bandwidth	MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP le	ength		Normal	· ·
Spec config	ial subframe guration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells
	k-downlink guration		1	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	ndividual offset for cells channel number 1	dB	0	Individual offset for cells on primary component carrier.
	ndividual offset for cells channel number 2	dB	0	Individual offset for cells on secondary component carrier.
Filter	coefficient		0	L3 filtering is not used
	measurement cycle	ms	1280	
	timing offset to cell1	μs	0	
	alignment error een cell2 and cell1	μs	≤ Time alignment error as specified in TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3	timing offset to cell1	μs	3	Synchronous cells
T1	-	s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2 s		S	≤30	UE shall report Event A6 within 25.6s (20xscellMeasCycle)

This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.4.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter	Unit	Се	II 1	Ce	ell 2	Ce	II 3	
		T1	T2	T1	T1 T2		T2	
E-UTRA RF Channel		•	1		2		2	
Number								
BW _{channel}	MHz	1	0	•	10	1	0	
OCNG Pattern defined								
in A.3.2.2.1 (OP.1		OP.1	TDD	OP.2	2 TDD	OP.2	TDD	
TDD) and in A.3.2.2.2								
(OP.2 TDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB	(0		0	0		
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
N_{oc} Note 3	dBm/15 kHz			-	98			
RSRP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82	
\hat{E}_{s}/I_{ot}	dB	16	16	16	-0.11	-Infinity	-0.11	
SCH_RP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82	
\hat{E}_s/N_{oc}	dB	16	16	16	16	-Infinity	16	
Propagation Condition				AV	VGN	•		

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

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.16.4.2 Test Requirements

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25.6s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth

A.8.16.5.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.5.1-1 and A.8.16.5.1-2 will replace the values of corresponding parameters in Tables A.8.16.1.1-1 and A.8.16.1.1-2.

Table A.8.16.5.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.1
		Channel R.4 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.10 FDD	·
Channel Bandwidth	MHz	20	Channel bandwidth for cells on primary
(BW _{channel})		20	and secondary component carriers
A2 Threshold RSRP	dBm		Actual RSRP threshold for event A2.
		06	Needs to take absolute accuracy tolerance
		-96	in clause 9.1.11.1 into account plus
			margin.

Note 1: See Table A.8.16.1.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.5.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter	Unit		Cell 1			Cell 2		Cell 3			
		T1	T2	Т3	T1	T2	Т3	T1	T2	Т3	
BW _{channel}	MHz		20			20			20		
OCNG Patterns defined in A.3.2.1.11 (OP.11 FDD) and in A.3.2.1.12 (OP.12 FDD)		OP.11 FDD			OP.12 FDD			OP.12 FDD			
N _{oc} Note 2	dBm/15 kHz		-104				-104				
RSRP Note 3	dBm/15 kHz	-85	-85	-107	-85	-85	-107	-infinity	-85	-107	
Ê _s /I _{ot}	dB	19	19	-3	19	-0.05	-4.76	-infinity	-0.05	-4.76	
SCH_RP Note 3	dBm/15 kHz	-85	-85	-107	-85	-85	-107	-infinity	-85	-107	
Ê _s /N _{oc}	dB	19	19	-3	19	19	-3	-infinity	19	-3	
Note: See Ta											

A.8.16.5.2 Test Requirements

The test requirements defined in section A.8.16.1.2 shall apply to this test case.

A.8.16.6 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth

A.8.16.6.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.2. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.6.1-1 and A.8.16.6.1-2 will replace the values of corresponding parameters in Tables A.8.16.2.1-1 and A.8.16.2.1-2.

Table A.8.16.6.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Para	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.3 TDD	As specified in section A.3.1.1.2
PCFICH/PDC parameters	CH/PHICH		DL Reference Measurement Channel R.10 TDD	As specified in section A.3.1.2.2
Channel Band (BW _{channel})	dwidth	MHz	20	Channel bandwidth for cells on primary and secondary component carriers
A2	Threshold RSRP	dBm	-96	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.

Note 1: See Table A.8.16.2.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.6.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter	Unit	Cell 1				Cell 2		Cell 3			
		T1	T2	T3	T1	T2	T3	T1	T2	T3	
BW _{channel}	MHz		20			20			20		
OCNG											
Patterns		О	P.7 TDD			OP.8 TDE)	OP.8 TDD			
defined in											
A.3.2.2.7											
(OP.7 TDD)											
and in											
A.3.2.2.8											
(OP.8 TDD)											
N _{oc} Note 2	dBm/15 kHz		-104				-1	-104			
RSRP Note 3	dBm/15 kHz	-85	-85	-107	-85	-85	-107	-infinity	-85	-107	
Ê _s /I _{ot}	dB	19	19	-3	19	-0.05	-4.76	-infinity	-0.05	-4.76	
SCH_RP Note 3	dBm/15 kHz	-85	-85	-107	-85	-85	-107	-infinity	-85	-107	
Ê _s /N _{oc}	dB	19	19	-3	-3 19 19 -3 -infinity 19			19	-3		
Note: See	Table A.8.16.2.1	-2 for other	r cell-spe	cific test	paramete	ers.		•	•		

A.8.16.6.2 Test Requirements

The test requirements defined in section A.8.16.2.2 shall apply to this test case.

A.8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth

A.8.16.7.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.3. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.7.1-1 and A.8.16.7.1-2 will replace the values of corresponding parameters in Tables A.8.16.3.1-1 and A.8.16.3.1-2.

Table A.8.16.7.1-1: General test parameters for E-UTRAN FDD event-triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Value	Comment					
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.1					
		Channel R.6 FDD						
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1					
parameters		Channel R.10 FDD						
Channel Bandwidth	MHz	20	Channel bandwidth for cells on primary					
(BW _{channel})		20	and secondary component carriers					
Note 1: See Table A.8.16.3.1-1 for other general test parameters.								
Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according								
to the principle define	ned in se	ction A.3.6.1.						

Table A.8.16.7.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

MHz		T2 20 7 FDD		T2 20 2 FDD	71 20 OP.12		
		-		-			
dBm/15	OP.17	7 FDD	OP.12	2 FDD	OP.12	FDD	
dBm/15			1				
kHz	-1	01		-101			
dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85	
dB	16	16	16	-0.11	-Infinity	-0.11	
dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85	
dB	16	16	16	16	-Infinity	16	
	dBm/15 kHz dB dBm/15 kHz dB	dBm/15	dBm/15 -85 -85 kHz 16 16 dBm/15 -85 -85 kHz 16 16 dB 16 16	dBm/15 kHz -85 -85 -85 dB 16 16 16 dBm/15 kHz -85 -85 -85 dB 16 16 16	dBm/15 kHz -85 -85 -85 -85 dB 16 16 16 -0.11 dBm/15 kHz -85 -85 -85 -85	dBm/15 kHz -85 -85 -85 -1nfinity dB 16 16 16 -0.11 -Infinity dBm/15 kHz -85 -85 -85 -1nfinity dB 16 16 16 16 -Infinity	

A.8.16.7.2 Test Requirements

The test requirements defined in section A.8.16.3.2 shall apply to this test case.

A.8.16.8 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth

A.8.16.8.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.4. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.8.1-1 and A.8.16.8.1-2 will replace the values of corresponding parameters in Tables A.8.16.4.1-1 and A.8.16.4.1-2.

Table A.8.16.8.1-1: General test parameters for E-UTRAN TDD event-triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in section A.3.1.2.2
Channel Bandwidth (BW _{channel})	MHz	20	Channel bandwidth for cells on primary and secondary component carriers

Note 1: See Table A.8.16.4.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.8.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit			Ce	ell 2	Cel	I 3	
		T1	T2	T1	T2	T1	T2	
BW _{channel}	MHz	2	0	2	20	20		
OCNG Patterns defined in A.3.2.2.7 (OP.7 TDD) and in A.3.2.2.8 (OP.8 TDD)		OP.7	TDD	OP.8	3 TDD	OP.8 TDD		
$N_{oc}^{$	dBm/15 kHz	-1	01		-101			
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85	
\hat{E}_{s}/I_{ot}	dB	16	16	16	-0.11	-Infinity	-0.11	
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85	
\hat{E}_s/N_{oc}	dB	16	16	16	16	-Infinity	16	
Note: See Table A.8.16.4	.1-2 for oth	er cell-spe	cific test pa	arameters				

A.8.16.8.2 Test Requirements

The test requirements defined in section A.8.16.4.2 shall apply to this test case.

A.8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz

A.8.16.9.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.1.1.

The test parameters are the same as defined in Subclause A.8.16.1.1 except those described in the following section. The listed parameter values in Tables A.8.16.9.1-1 and A.8.16.9.1-2 will replace the values of corresponding parameters in Tables A.8.16.1.1-1 and A.8.16.1.1-2.

Table A.8.16.9.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
Channel bandwidth for cells			Channel bandwidth for cells on primary
on primary carriers	MHz	10	carriers
(BW _{channel})			
Channel bandwidth for cells			Channel bandwidth for cells on secondary
on secondary carriers	MHz	5	carriers
(BW _{channel})			

Note 1: See Table A.8.16.1.1-1 for the other general parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.9.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	Т3	T1	T2	Т3
BW _{channel}	MHz		10			5			5	
PDSCH Reference			R.0 FDD			N/A			N/A	
measurement channel										
defined in A.3.1.1.1										
PDSCH allocation	n_{PRB}	13—36 N/A			N/A					
PCFICH/PDCCH/PHIC		R.6 FDD		R.11 FDD		R.11 FDD				
H parameters defined										
in A.3.1.2.1										
OCNG Patterns										
defined in A.3.2.1.1		C	P.1 FDD		0	P.16 FDE)	0	P.16 FDD)
(OP.1 FDD) and in										
A.3.2.1.16 (OP.16										
FDD)										
Note 1: See Table A.8.16	Note 1: See Table A.8.16.1.1-2 for the other specific parameters.									

A.8.16.9.2 **Test Requirements**

The test requirements defined in section A.8.16.1.2 shall apply to this test case.

A.8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz

A.8.16.10.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.2.1.

The test parameters are the same as defined in Subclause A.8.16.2.1 except those described in the following section. The listed parameter values in Tables A.8.16.10.1-1 and A.8.16.10.1-2 will replace the values of corresponding parameters in Tables A.8.16.2.1-1 and A.8.16.2.1-2.

Table A.8.16.10.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carriers (BW _{channel})	MHz	10	Channel bandwidth for cells on primary carriers
Channel bandwidth for cells on secondary carriers (BW _{channel})	MHz	5	Channel bandwidth for cells on secondary carriers

See Table A.8.16.2.1-1 for the other general parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.10.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit		Cell 1			Cell 2			Cell 3		
		T1	T2	Т3	T1	T2	Т3	T1	T2	Т3	
BW _{channel}	MHz		10			5			5		
PDSCH Reference			R.0 TDD			N/A			N/A		
measurement channel											
defined in A.3.1.1.2											
PDSCH allocation	n_{PRB}	13—36		N/A		N/A					
PCFICH/PDCCH/PHIC		R.6 TDD		R.12 TDD			R.12 TDD				
H parameters defined											
in A.3.1.2.2											
OCNG Patterns											
defined in A.3.2.2.1		(OP.1 TDE)	OP.10 TDD		OP.10 TDD)		
(OP.1 TDD) and in											
A.3.2.2.10 (OP.10											
TDD)											
Note 1: See Table A.8											

A.8.16.10.2 Test Requirements

The test requirements defined in section A.8.16.2.2 shall apply to this test case.

A.8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

A.8.16.11.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.3. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.11.1-1 and A.8.16.11.1-2 will replace the values of corresponding parameters in Tables A.8.16.3.1-1 and A.8.16.3.1-2.

Table A.8.16.11.1-1: General test parameters for E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Value	Comment		
Channel bandwidth for cells	MHz	10	Channel bandwidth for cells on		
on primary carrier (BW _{channel})			primary component carrier		
PDSCH parameters for cells		DL Reference Measurement	As specified in section A.3.1.1.1		
on primary carriers		Channel R.3 FDD	As specified in section A.S.1.1.1		
PCFICH/PDCCH/PHICH		DL Reference Measurement			
parameters for cells on			As specified in section A.3.1.2.1		
primary carriers		Channel R.6 FDD			
Channel bandwidth for cells			Channel bandwidth for cells on		
on secondary carriers	MHz	5			
(BW _{channel})			secondary component carrier		
PCFICH/PDCCH/PHICH		DL Reference Measurement			
parameters for cells on			As specified in section A.3.1.2.1		
secondary carrier		Channel R.11 FDD			
Note 1: See Table A.8.16.3	.1-1 for o	ther general test parameters.			

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.11.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Ce	ell 1	C	ell 2	Cell 3	
		T1	T2	T1	T2	T1	T2
BW _{channel}	MHz	10 5 5					
OCNG Patterns defined in A.3.2.1		OP.10 FDD					
Note: See Table A.8.16.3.1-2 for other cell-specific test parameters.							

A.8.16.11.2 Test Requirements

The test requirements defined in section A.8.16.3.2 shall apply to this test case.

A.8.16.12 E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

A.8.16.12.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.4. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.12.1-1 and A.8.16.12.1-2 will replace the values of corresponding parameters in Tables A.8.16.4.1-1 and A.8.16.4.1-2.

Table A.8.16.12.1-1: General test parameters for E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carrier (BW _{channel})	MHz	10	Channel bandwidth for cells on primary component carrier
PDSCH parameters for cells on primary carriers		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters for cells on primary carriers		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Channel bandwidth for cells on secondary carriers (BW _{channel})	MHz	5	Channel bandwidth for cells on secondary component carrier
PDSCH parameters for cells on secondary carrier		DL Reference Measurement Channel R.4 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters for cells on secondary carrier		DL Reference Measurement Channel R.11 TDD	As specified in section A.3.1.2.2

Note 1: See Table A.8.16.4.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.12.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Ce	II 1	C	ell 2	Cell 3	
		T1	T2	T1	T2	T1	T2
BW _{channel}	MHz 10 5 5						
OCNG Patterns defined in A.3.2.2	OP.1 TDD OP.10 TDD OP.10 TDD						
Note: See Table A.8.16.4.1-2 for other cell-specific test parameters.							

A.8.16.12.2 Test Requirements

The test requirements defined in section A.8.16.4.2 shall apply to this test case.

A.8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz +5 MHz bandwidth

A.8.16.13.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.13.1-1 and A.8.16.13.1-2 will replace the values of corresponding parameters in Tables A.8.16.1.1-1 and A.8.16.1.1-2.

Table A.8.16.13.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 5MHz +5 MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.1
	-	Channel R.5 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.11 FDD	
Channel Bandwidth	MHz	F	Channel bandwidth for cells on primary
(BW _{channel})	IVITIZ	5	component carrier
Channel Bandwidth	MHz	F	Channel bandwidth for cells on secondary
(BW _{channel})	IVIHZ	5	component carrier

Note 1: See Table A.8.16.1.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.13.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 5MHz +5 MHz bandwidth

Parameter	Unit		Cell 1		Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
BW _{channel}	MHz	10		3			3			
OCNG Patterns										
defined in A.3.2.1.15		0	P.15 FDE)	0	P.16 FDI)	0	P.16 FDI	D
(OP.15.FDD) and in										
À.3.2.1.16 (ÓP.16										
FDD)										
Note: See Table A.	8.16.1.1-2 for (other cell-	specific to	est parai	neters.					

A.8.16.13.2 Test Requirements

The test requirements defined in section A.8.16.1.2 shall apply to this test case.

A.8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5 MHz +5 MHz bandwidth

A.8.16.14.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.2. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.14.1-1 and A.8.16.14.1-2 will replace the values of corresponding parameters in Tables A.8.16.2.1-1 and A.8.16.2.1-2.

Table A.8.16.14.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 10 MHz +5 MHz bandwidth

Parameter	Unit	Value	Comment		
PDSCH parameters		DL Reference Measurement Channel R.4.TDD	As specified in section A.3.1.1.2		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 TDD	As specified in section A.3.1.2.2		
Channel Bandwidth (BW _{channel})	MHz	5	Channel bandwidth for cells on primary component carrier		
Channel Bandwidth (BW _{channel})	MHz	5	Channel bandwidth for cells on secondary component carrier		

Note 1: See Table A.8.16.2.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.14.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 10 MHz +5 MHz bandwidth

Parameter	Unit		Cell 1			Cell 2		Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
BW _{channel}	MHz		10			3			3	
OCNG Patterns										
defined in A.3.2.2.9		(OP.9 TDD		C	P.10 TDD)	0	P10 TDE)
(OP.9 TDD) and in										
A.3.2.2.10 (OP.10										
TDD)										
Note: See Table A	Note: See Table A.8.16.2.1-2 for other cell-specific test parameters.									

A.8.16.14.2 Test Requirements

The test requirements defined in section A.8.16.2.2 shall apply to this test case.

A.8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5 +5 MHz bandwidth

A.8.16.15.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.3. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.15.1-1 and A.8.16.14.1-2 will replace the values of corresponding parameters in Tables A.8.16.3.1-1 and A.8.16.3.1-2.

Table A.8.16.15.1-1: General test parameters for E-UTRAN FDD event-triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 5 + 5 MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.7 FDD (Cell 1)	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in section A.3.1.2.1
Channel Bandwidth (BW _{channel})	MHz	5	Channel bandwidth for cells on primary and secondary component carriers

Note 1: See Table A.8.16.3.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.15.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 5+5 MHz bandwidth

Parameter	Unit	Ce	Cell 1		ell 2	Cell 3		
		T1	T2	T1 T2		T1	T2	
BW _{channel}	MHz	5		5		5		
OCNG Patterns defined								
in A.3.2.1.20 (OP.20		OP 20 EDD OP		OD 1	e EDD	OP.16	EDD	
FDD) and in A.3.2.1.16		OP.20 FDD		OP.16 FDD		OF.16	רטט	
(OP.16 FDD)								
Note: See Table A.8.1	Note: See Table A.8.16.3.1-2 for other cell-specific test parameters.							

A.8.16.7.2 Test Requirements

The test requirements defined in section A.8.16.3.2 shall apply to this test case.

A.8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5 MHz bandwidth

A.8.16.16.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.4. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.16.1-1 and A.8.16.16.1-2 will replace the values of corresponding parameters in Tables A.8.16.4.1-1 and A.8.16.4.1-2.

Table A.8.16.16.1-1: General test parameters for E-UTRAN TDD event-triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 5+5 MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.4 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 TDD	As specified in section A.3.1.2.2
Channel Bandwidth (BW _{channel})	MHz	5	Channel bandwidth for cells on primary and secondary component carriers

Note 1: See Table A.8.16.4.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.16.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 5+5 MHz bandwidth

Parameter	Unit	Ce	II 1	C	Cell 2		l 3
		T1	T2	T1	T2	T1	T2
BW _{channel}	MHz	Ę	5		5	5	
OCNG Patterns defined in							
A.3.2.2.9 (OP.9 TDD) and in		OP.9	TDD	OP.1	0 TDD	OP.10	TDD
A.3.2.2.10 (OP.10 TDD)							
Note: See Table A.8.16.4.1-2 for other cell-specific test parameters.							

A.8.16.16.2 Test Requirements

The test requirements defined in section A.8.16.4.2 shall apply to this test case.

A.8.16.17 E-UTRAN FDD activation and deactivation of known SCell in non-DRX

A.8.16.17.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7, when the SCell is known by the UE at the time of activation.

The test parameters are given in Tables A.8.16.17.1-1 and cell-specific parameters in A.8.16.17.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (Cell 2) becomes configured on radio channel 2 (SCC). The UE now starts monitoring also the SCC. The test equipment sends a MAC message for activation of the SCell.

The point in time at which the MAC message is received at the UE antenna connector, in a subframe # denoted m which is an even number, defines the start of time period T2. The UE shall be able to report valid CSI for the activated SCell at latest in subframe (m+24). The UE shall start reporting CSI in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCell shall occur in the subframes (m+5) to (m+9).

Time period T3 starts when a MAC message for deactivation of SCell, sent from the test equipment to the UE in a subframe # denoted n which is an even number, is received at the UE antenna connector. The UE shall carry out deactivation of the SCell in a subframe (n+8), and any PCell interruption due to the deactivation shall occur in the subframes (n+5) to (n+9).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell activation command is sent until a CSI report with other than COI index 0 is received.

The test equipment verifies the deactivation time by counting the subframes from the time when the SCell deactivation command is sent until CQI reporting for SCell is discontinued.

Table A.8.16.17.1-1: General test parameters for known SCell activation case

Parameter	Unit	Value	Comment		
PDSCH parameters		DL Reference Measurement Channel R.3 FDD (Cell 1)	As specified in section A.3.1.1.1		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1		
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test		
Active PCell		Cell 1	Primary cell on RF channel number 1.		
Configured deactivated SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.		
CP length		Normal			
DRX		OFF	Continuous monitoring of primary cell		
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe		
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on primary component carrier.		
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on secondary component carrier.		
SCell measurement cycle (measCycleSCell)	ms	320			
Cell2 timing offset to cell1	μs	0			
Time alignment error between cell2 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.		
T1	S	7	During this time the PCell shall be known and the SCell configured and detected.		
T2	S	1	During this time the UE shall activate the SCell.		
Т3	S	1	During this time the UE shall deactivate the SCell.		

ote: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.17.1-2: Cell specific test parameters for E-UTRAN FDD known SCell activation

Parameter	Unit	Cell 1			Cell 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel		1			2			
Number		1						
BW _{channel}	MHz	10			10			
OCNG Patterns								
defined in A.3.2.1.1		OP.10 FDD		OP.2 FDD				
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB	0						
PHICH_RA	dB			0				
PHICH_RB	dB							
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
Noc Note 2	dBm/15 kHz	-104		-104				
RSRP Note 3	dBm/15 kHz	-87		-87				
Ê _s /I _{ot}	dB	17		17				
SCH_RP Note 3	dBm/15 kHz	-87		-87		•		
Ê _s /N _{oc}	dB	17			17			
Propagation Condition		AWGN						
	e used such that al density is achie	eved for all	OFDM syr	nbols.				

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

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

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

A.8.16.17.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+10) if the suframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+24).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+9).

During T3 interruption of PCell during SCell deactivation shall not happen outside the subframes (n+5) to (n+9).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+24) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.17A E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz

A.8.16.17A.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.17. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.17A.1-1 and A.8.16.17A.1-2 will replace the values of corresponding parameters in Tables A.8.16.17.1-1 and A.8.16.17.1-2.

Table A.8.16.17A.1-1: General test parameters for known SCell activation case, 20MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 FDD	As specified in section A.3.1.2.1

Table A.8.16.17A.1-2: Cell specific test parameters for E-UTRAN FDD known SCell activation, 20MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			
		T1	T2	T3	T1	T2	T3	
BW _{channel}	MHz	20			20			
OCNG Patterns								
defined in A.3.2.1.17		OP.17 FDD OF			P.12.FDD			
(OP.17 FDD) and in								
A.3.2.1.12 (OP.12								
FDD)								

A.8.16.17A.2 Test Requirements

The test requirements defined in section A.8.16.17.2 shall apply to this test case.

A.8.16.17B E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 10MHz + 5MHz

A.8.16.17B.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.17. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.17B.1-1 and A.8.16.17B.1-2 will replace the values of corresponding parameters in Tables A.8.16.17.1-1 and A.8.16.17.1-2.

Table A.8.16.17B.1-1: General test parameters for known SCell activation case, 10+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.1
		Channel R.3 FDD (Cell 1)	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD (Cell 1)	
		DL Reference Measurement	
		Channel R.11 FDD (Cell 2)	

Table A.8.16.17B.1-2: Cell specific test parameters for E-UTRAN FDD known SCell activation, 10+5MHz bandwidth

Parameter	Unit	Cell 1					
		T1	T2	T3	T1	T2	T3
BW _{channel}	MHz	10			5		
OCNG Patterns							
defined in A.3.2.1.11		OP.10 FDD OP.16.FD				P.16.FDD	
(OP.11 FDD) and in							
A.3.2.1.16 (OP.16							
FDD)							

A.8.16.17B.2Test Requirements

The test requirements defined in section A.8.16.17.2 shall apply to this test case.

A.8.16.17C E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 5MHz + 5MHz

A.8.16.17C.1Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.17. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.17C.1-1 and A.8.16.17C.1-2 will replace the values of corresponding parameters in Tables A.8.16.17.1-1 and A.8.16.17.1-2.

Table A.8.16.17C.1-1: General test parameters for known SCell activation case, 5+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.7 FDD (Cell 1)	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in section A.3.1.2.1

Table A.8.16.17C.1-2: Cell specific test parameters for E-UTRAN FDD known SCell activation, 5+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
BW _{channel}	MHz	5			5		
OCNG Patterns defined in A.3.2.1.15 (OP.15 FDD) and in A.3.2.1.16 (OP.16 FDD)		OP.20 FDD			C)P.16.FDD	

A.8.16.17C.2Test Requirements

The test requirements defined in section A.8.16.17.2 shall apply to this test case.

A.8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX

A.8.16.18.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7, when the SCell is known by the UE at the time of activation.

The test parameters are given in Tables A.8.16.18.1-1 and cell-specific parameters in A.8.16.18.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC)

but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (Cell 2) becomes configured on radio channel 2 (SCC). The UE now starts monitoring also the SCC. The test equipment sends a MAC message for activation of the SCell.

The point in time at which the MAC message is received at the UE antenna connector, in a subframe # denoted m, where m is 4 or 9, defines the start of time period T2. The UE shall be able to report valid CSI for the activated SCell at latest in subframe (m+24). The UE shall start reporting CSI in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCell shall occur in the subframes (m+5) to (m+11).

Time period T3 starts when a MAC message for deactivation of SCell, sent from the test equipment to the UE in a subframe # denoted n where n is 4 or 9, is received at the UE antenna connector. The UE shall carry out deactivation of the SCell and any PCell interruption due to the deactivation shall occur in the subframes (n+5) to (n+11).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the subframes from the time when the SCell deactivation command is sent until CQI reporting for SCell is discontinued.

Table A.8.16.18.1-1: General test parameters for known SCell activation case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
Channel Bandwidth (BW _{channel})	MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration		1	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on secondary component carrier.
SCell measurement cycle (measCycleSCell)	ms	320	
Cell2 timing offset to cell1	μs	0	
Time alignment error between cell2 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1	μs	3	Synchronous cells
T1	s	7	During this time the PCell shall be known and the SCell configuredand detected.
T2	S	1	During this time the UE shall activate the SCell.
T3	S	1	During this time the UE shall deactivate the SCell.

This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.18.1-2: Cell specific test parameters for E-UTRAN TDD known SCell activation

Parameter	Unit		Cell 1			Cell 2		
		T1 T2 T3			T1	T2	Т3	
E-UTRA RF Channel		1			2			
Number						2		
BW _{channel}	MHz		10			10		
OCNG Patterns								
defined in A.3.2.2.1			OP.1 TDD		(OP.2 TDD		
(OP.1 TDD) and in								
A.3.2.2.2 (OP.2 TDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB				0			
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB		0					
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
Noc Note 2	dBm/15 kHz		-104			-104		
RSRP Note 3	dBm/15 kHz		-87			-87		
Ê _s /I _{ot}	dB	17		17 1		17		
SCH_RP Note 3	dBm/15 kHz	-87			-87			
Ê _s /N _{oc}	dB	17 17						
Propagation Condition					'GN			
Note 1: OCNG shall b	e used such that	all cells a	re fully allo	cated and	d a constar	nt total tran	smitted	
nower enectro	donaity ia aabia	wad for al	OEDM over	mholo				

- power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
- Es/lot, RSRP and SCH_RP levels have been derived from other parameters for Note 3: information purposes. They are not settable parameters themselves.
- The uplink resources for CSI reporting are assigned to the UE prior to the start of time Note 4: period T2.

A.8.16.18.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated. Whether CSI report in subframe (m+8) and/or (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) and/or (m+9).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+24).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (m+8).

During T2 interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+11).

During T3 interruption of PCell during SCell deactivation shall not happen outside the subframes (n+5) to (n+11).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+24) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.18A E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz

A.8.16.18A.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.18. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.18A.1-1 and A.8.16.18A.1-2 will replace the values of corresponding parameters in Tables A.8.16.18.1-1 and A.8.16.18.1-2.

Table A.8.16.18A.1-1: General test parameters for known SCell activation case, 20MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2

Table A.8.16.18A.1-2: Cell specific test parameters for E-UTRAN TDD known SCell activation, 20MHz bandwidth

Parameter	Unit		Cell 1			Cell 2			
		T1	T2	Т3	T1	T2	T3		
BW _{channel}	MHz	20			20				
OCNG Patterns									
defined in A.3.2.2.7			OP.7 TDD			OP.2.TDD			
(OP.7 TDD) and in									
À.3.2.2.2 (ÓP.2 TDD)									

A.8.16.18A.2 Test Requirements

The test requirements defined in section A.8.16.18.2 shall apply to this test case.

A.8.16.18B E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 10MHz + 5MHz

A.8.16.18B.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.18. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.18B.1-1 and A.8.16.18B.1-2 will replace the values of corresponding parameters in Tables A.8.16.18.1-1 and A.8.16.18.1-2.

Table A.8.16.18B.1-1: General test parameters for known SCell activation case, 10 + 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD (cell 1) DL Reference Measurement Channel R.12 TDD (cell 2)	As specified in section A.3.1.2.2

Table A.8.16.18B.1-2: Cell specific test parameters for E-UTRAN TDD known SCell activation, 10 + 5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	Т3	T1	T2	Т3
BW _{channel}	MHz	10			5		
OCNG Patterns							
defined in A.3.2.2.1		OP.1 TDD				P.10.TDD	
(OP.1 TDD) and in							
A.3.2.2.10 (OP.10							
TDD)							

A.8.16.18B.2Test Requirements

The test requirements defined in section A.8.16.18.2 shall apply to this test case.

A.8.16.18C E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 5MHz + 5MHz

A.8.16.18C.1Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.18. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.18C.1-1 and A.8.16.18C.1-2 will replace the values of corresponding parameters in Tables A.8.16.18.1-1 and A.8.16.18.1-2.

Table A.8.16.18C.1-1: General test parameters for known SCell activation case, 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.4 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 TDD	As specified in section A.3.1.2.2

Table A.8.16.18C.1-2: Cell specific test parameters for E-UTRAN TDD known SCell activation, 5MHz bandwidth

Parameter	Unit		Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3	
BW _{channel}	MHz	5			5			
OCNG Patterns								
defined in A.3.2.2.9		OP.9 TDD OP.10.TDD						
(OP.9 TDD) and in								
A.3.2.2.10 (OP.10								
TDD)								

A.8.16.18C.2Test Requirements

The test requirements defined in section A.8.16.18.2 shall apply to this test case.

A.8.16.18D E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz + 10MHz

A.8.16.18D.1Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.18. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.18D.1-1 and A.8.16.18D.1-2 will replace the values of corresponding parameters in Tables A.8.16.18.1-1 and A.8.16.18.1-2.

Table A.8.16.18D.1-1: General test parameters for known SCell activation case, 20 + 10MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD (cell 1) DL Reference Measurement Channel R.6 TDD (cell 2)	As specified in section A.3.1.2.2

Table A.8.16.18D.1-2: Cell specific test parameters for E-UTRAN TDD known SCell activation, 10 + 5MHz bandwidth

Parameter	Unit	Cell 1				Cell 2	
		T1	T2	T3	T1	T2	T3
BW _{channel}	MHz		20		10		
OCNG Patterns							
defined in A.3.2.2.7			OP.7 TDD			OP.2.TDD	
(OP.7 TDD) and in							
À.3.2.2.2 (ÓP.2 TDD)							

A.8.16.18D.2Test Requirements

The test requirements defined in section A.8.16.18.2 shall apply to this test case.

A.8.16.19 E-UTRAN FDD activation and deactivation of unknown SCell in non-DRX

A.8.16.19.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7, when the SCell is unknown by the UE at the time of activation.

The test parameters are given in Tables A.8.16.19.1-1 and cell-specific parameters in A.8.16.19.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Cell 1 has constant signal level throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (cell2) becomes configured on radio channel 2 (SCC). During T1 the SCell is powered off and UE is not aware of SCell.

A MAC message for activation of SCell is sent by the test equipment 100ms after the RRC message, in a subframe # denoted m which is an even number. The point in time at which the MAC message for activation of SCell is received at the UE antenna connector defines the start of time period T2. Immediately at beginning of T2 the transmission power of cell 2 is increased to same level as for cell 1. The UE shall be able to report valid CSI for the activated SCell at latest in subframe (m+34) provided the SCell can be successfully detected on the first attempt. The UE shall start reporting CSI in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCell shall occur in the subframes (m+5) to (m+9).

Time period T3 starts when a MAC message for deactivation of the SCell, sent from the test equipment to the UE in a subframe # denoted n which is an even number, is received at the UE antenna connector. The UE shall carry out deactivation of the SCell at latest in subframe (n+8), and any PCell interruption due to the deactivation shall occur in the subframes (n+5) to (n+9).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation of SCell, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the subframes from the time when the SCell1 deactivation command is sent until CQI reporting for SCell1 is discontinued.

Table A.8.16.19.1-1: General test parameters for unknown SCell activation case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
SCell measurement cycle (measCycleSCell)	ms	320	
Cell2 timing offset to cell1	μs	0	
Time alignment error between cell2 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	ms	100	During this time the PCell shall be known and the SCell configured, but not dectected.
T2	S	1	During this time the UE shall activate the SCell.
T3	S	1	During this time the UE shall deactivate the SCell.
Note: This test verifies the to the principle def			nannel bandwidth and is performed according

Table A.8.16.19.1-2: Cell specific test parameters for E-UTRAN FDD unknown SCell activation

Parameter	Unit		Cell 1				
		T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel			1			2	
Number			!				
BW _{channel}	MHz		10			10	
OCNG Patterns							
defined in A.3.2.1.1		(OP.1 FDD		(OP.2 FDD	
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		0			0	
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						

Noc Note 2	dBm/15 kHz	-104		-104		
RSRP Note 3	dBm/15 kHz	-87	-infinity	-87		
Ê _s /I _{ot}	dB	17	-infinity	17		
SCH_RP Note 3	dBm/15 kHz	-87	-infinity	-87		
Ê _s /N _{oc}	dB	17	-infinity	17		
Propagation Condition		AWGN				

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Nos to be fulfilled.
- Note 3: Es/lot, RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

A.8.16.19.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell (m+8), or in a subframe (m+10) if the subframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+34).

During T3 the UE shall stop sending CSI reports for SCell1 at latest in a subframe (n+8).

During T2 Interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+9).

During T3 Interruption of PCell during SCell1 deactivation shall not happen outside the subframes (n+5) to (n+9).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay to be counted as correct. The rate of correct observed SCell activation and deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+34) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.19A E-UTRAN FDD activation and deactivation of unknown SCell in non-DRX for 20MHz

A.8.16.19A.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.19. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.19A.1-1 and A.8.16.19A.1-2 will replace the values of corresponding parameters in Tables A.8.16.19.1-1 and A.8.16.19.1-2.

Table A.8.16.19A.1-1: General test parameters for unknown SCell activation case, 20MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.1
		Channel R.6 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.10 FDD	

Table A.8.16.19A.1-2: Cell specific test parameters for E-UTRAN FDD unknown SCell activation, 20MHz bandwidth

Parameter	Unit	Cell 1				Cell 2		
		T1	T2	T3	T1	T2	T3	
BW _{channel}	MHz		20		20			
OCNG Patterns								
defined in A.3.2.1.17			OP.17 FDD			P.12.FDD		
(OP.17 FDD) and in								
A.3.2.1.12 (OP.12								
FDD)								

A.8.16.19A.2 Test Requirements

The test requirements defined in section A.8.16.19.2 shall apply to this test case.

A.8.16.19B E-UTRAN FDD activation and deactivation of unknown SCell in non-DRX for 10MHz + 5MHz

A.8.16.19B.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.19. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.19B.1-1 and A.8.16.19B.1-2 will replace the values of corresponding parameters in Tables A.8.16.19.1-1 and A.8.16.19.1-2.

Table A.8.16.19B.1-1: General test parameters for unknown SCell activation case, 10+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.1
		Channel R.3 FDD (Cell 1)	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD (Cell 1)	
		DL Reference Measurement	
		Channel R.11 FDD (Cell 2)	

Table A.8.16.19B.1-2: Cell specific test parameters for E-UTRAN FDD unknown SCell activation, 10+5MHz bandwidth

Parameter	Unit	Cell 1				Cell 2	
		T1	T2	T3	T1	T2	Т3
BW _{channel}	MHz		10		5		
OCNG Patterns							
defined in A.3.2.1.11			P.10 FDD		C	P.16.FDD	
(OP.11 FDD) and in		01.1101.00					
A.3.2.1.16 (OP.16							
FDD)							

A.8.16.19B.2Test Requirements

The test requirements defined in section A.8.16.19.2 shall apply to this test case.

A.8.16.19C E-UTRAN FDD activation and deactivation of unknown SCell in non-DRX for 5MHz + 5MHz

A.8.16.19C.1Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.19. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.19C.1-1 and A.8.16.19C.1-2 will replace the values of corresponding parameters in Tables A.8.16.19.1-1 and A.8.16.19.1-2.

Table A.8.16.19C.1-1: General test parameters for unknown SCell activation case, 5+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.1
		Channel R.7 FDD (Cell 1)	•
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.11 FDD	

Table A.8.16.19C.1-2: Cell specific test parameters for E-UTRAN FDD unknown SCell activation, 5+5MHz bandwidth

Parameter	Unit	Cell 1				Cell 2		
		T1	T2	T3	T1	T2	Т3	
BW _{channel}	MHz		5		5			
OCNG Patterns								
defined in A.3.2.1.15			P.20 FDD			P.16.FDD		
(OP.15 FDD) and in								
A.3.2.1.16 (OP.16								
FDD)								

A.8.16.19C.2Test Requirements

The test requirements defined in section A.8.16.19.2 shall apply to this test case.

A.8.16.20 E-UTRAN TDD activation and deactivation of unknown SCell in non-DRX

A.8.16.20.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7, when the SCell is unknown by the UE at the time of activation.

The test parameters are given in Tables A.8.16.20.1-1 and cell-specific parameters in A.8.16.20.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Cell 1 has constant signal level throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (cell2) becomes configured on radio channel 2 (SCC). During T1 the signal level of SCell is powered off and UE is not aware of SCell.

A MAC message for activation of SCell is sent by the test equipment 100ms after the RRC message, in a subframe # denoted m, where m is 4 or 9. The point in time at which the MAC message for activation of SCell is received at the UE antenna connector defines the start of time period T2. Immediately at beginning of T2 the transmission power of cell 2 is increased to same level as for cell 1. The UE shall be able to report valid CSI for the activated SCell at latest in subframe (m+34) provided the SCell can be successfully detected on the first attempt. The UE shall start reporting CSI in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCell shall occur in the subframes (m+5) to (m+11).

Time period T3 starts when a MAC message for deactivation of the SCell, sent from the test equipment to the UE in a subframe # denoted n, where n is 4 or 9, is received at the UE antenna connector. The UE shall carry out deactivation of the SCell at latest in subframe (n+8), and any PCell interruption due to the deactivation shall occur in the subframes (n+5) to (n+11).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation of SCell, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the subframes from the time when the SCell1 deactivation command is sent until CQI reporting for SCell1 is discontinued.

Table A.8.16.20.1-1: General test parameters for unknown SCell activation case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
Channel Bandwidth (BW _{channel})	MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration		1	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
SCell measurement cycle (measCycleSCell)	ms	320	
Cell2 timing offset to cell1	μs	0	
Time alignment error between cell2 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1	μs	3	Synchronous cells
T1	ms	100	During this time the PCell shall be known and the SCell configured, but not dectected.
T2	S	1	During this time the UE shall activate the SCell.
Т3	S	1	During this time the UE shall deactivate the SCell.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.20.1-2: Cell specific test parameters for E-UTRAN TDD unknown SCell activation

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel			1				
Number			ı				
BW _{channel}	MHz		10			10	
OCNG Patterns							
defined in A.3.2.2.1		(OP.1 TDD			OP.2 TDD	
(OP.1 TDD) and in							
A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		0			0	
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
Noc Note 2	dBm/15 kHz		-104			-104	
RSRP Note 3	dBm/15 kHz		-87	•	-infinity	-8	•
Ê _s /I _{ot}	dB	17 -infinity		17	7		
SCH_RP Note 3	dBm/15 kHz		-87		-infinity	-8	7
Ê _s /N _{oc}	dB		17		-infinity	17	7
Propagation Condition				AW	/GN		

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
- Note 3: Es/lot, RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

A.8.16.20.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell at in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intraband SCell is activated. Whether first CSI report was interrupted or not is checked by monitoring ACK/NACK sent in PCell at the same time as the first CSI report.

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+34).

During T3 the UE shall stop sending CSI reports for SCell1 at latest in a subframe (n+8).

During T2 Interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+11).

During T3 Interruption of PCell during SCell1 deactivation shall not happen outside the subframes (n+5) to (n+11).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay to be counted as correct. The rate of correct observed SCell activation and deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+34) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.20A E-UTRAN TDD activation and deactivation of unknown SCell in non-DRX for 20MHz

A.8.16.20A.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.20. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.20A.1-1 and A.8.16.20A.1-2 will replace the values of corresponding parameters in Tables A.8.16.20.1-1 and A.8.16.20.1-2.

Table A.8.16.20A.1-1: General test parameters for unknown SCell activation case, 20MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2

Table A.8.16.20A.1-2: Cell specific test parameters for E-UTRAN TDD unknown SCell activation, 20MHz bandwidth

Parameter	Unit	Cell 1			Cell 2				
		T1	T2	T3	T1 T2 T3				
BW _{channel}	MHz		20		20				
OCNG Patterns									
defined in A.3.2.2.7		OP.7 TDD				OP.2.TDD			
(OP.7 TDD) and in									
A.3.2.2.2 (OP.2 TDD)									

A.8.16.20A.2 Test Requirements

The test requirements defined in section A.8.16.20.2 shall apply to this test case.

A.8.16.20B E-UTRAN TDD activation and deactivation of unknown SCell in non-DRX for 10MHz + 5MHz

A.8.16.20B.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.20. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.20B.1-1 and A.8.16.20B.1-2 will replace the values of corresponding parameters in Tables A.8.16.20.1-1 and A.8.16.20.1-2.

Table A.8.16.20B.1-1: General test parameters for unknown SCell activation case, 10 + 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.2
		Channel R.0 TDD	As specified in section A.S. 1.1.2
PCFICH/PDCCH/PHICH		DL Reference Measurement	
parameters		Channel R.6 TDD (cell 1)	As specified in section A.3.1.2.2
		DL Reference Measurement	As specified in section A.S. 1.2.2
		Channel R.12 TDD (cell 2)	

Table A.8.16.20B.1-2: Cell specific test parameters for E-UTRAN TDD unknown SCell activation, 10 + 5MHz bandwidth

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3	
BW _{channel}	MHz	10			5			
OCNG Patterns								
defined in A.3.2.2.1			OP.1 TDD		OP.10.TDD			
(OP.1 TDD) and in								
A.3.2.2.10 (OP.10								
TDD)								

A.8.16.20B.2 Test Requirements

The test requirements defined in section A.8.16.20.2 shall apply to this test case.

A.8.16.20C E-UTRAN TDD activation and deactivation of unknown SCell in non-DRX for 5MHz + 5MHz

A.8.16.20C.1Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.20. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.20C.1-1 and A.8.16.20C.1-2 will replace the values of corresponding parameters in Tables A.8.16.20.1-1 and A.8.16.20.1-2.

Table A.8.16.20C.1-1: General test parameters for unknown SCell activation case, 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.4 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 TDD	As specified in section A.3.1.2.2

Table A.8.16.20C.1-2: Cell specific test parameters for E-UTRAN TDD unknown SCell activation, 5MHz bandwidth

Parameter	Unit		Cell 1	Cell 2			
		T1	T2	T3	T1	T2	T3
BW _{channel}	MHz		5	5			
OCNG Patterns defined in A.3.2.2.9			OP.9 TDD	OP.10.TDD			
(OP.9 TDD) and in			01.0.122		,),obb	
A.3.2.2.10 (OP.10							
TDD)							

A.8.16.20C.2Test Requirements

The test requirements defined in section A.8.16.20.2 shall apply to this test case.

A.8.16.20D E-UTRAN TDD activation and deactivation of unknown SCell in non-DRX for 20MHz + 10MHz

A.8.16.20D.1Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.20. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.20D.1-1 and A.8.16.20D.1-2 will replace the values of corresponding parameters in Tables A.8.16.20.1-1 and A.8.16.20.1-2.

Table A.8.16.20D.1-1: General test parameters for unknown SCell activation case, 20 + 10MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD (cell 1) DL Reference Measurement Channel R.6 TDD (cell 2)	As specified in section A.3.1.2.2

Table A.8.16.20D.1-2: Cell specific test parameters for E-UTRAN TDD unknown SCell activation, 10 + 5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2				
		T1	T2	T3	T1 T2				
BW _{channel}	MHz		20			10			
OCNG Patterns									
defined in A.3.2.2.7			OP.7 TDD		OP.2.TDD				
(OP.7 TDD) and in									
À.3.2.2.2 (ÓP.2 TDD)									

A.8.16.20D.2Test Requirements

The test requirements defined in section A.8.16.20.2 shall apply to this test case.

A.8.16.21 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz

A.8.16.21.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.2. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.21.1-1 and A.8.16.21.1-2 will replace the values of corresponding parameters in Tables A.8.16.2.1-1 and A.8.16.2.1-2.

Table A.8.16.21.1-1: E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz

	Parameter	Unit	Value	Comment
	nel bandwidth for cells imary carrier (BW _{channel})	MHz	20	Channel bandwidth for cells on primary component carrier
	CH parameters for cells imary carriers		DL Reference Measurement Channel R.3 TDD	As specified in section A.3.1.1.2
parar	CH/PDCCH/PHICH neters for cells on rry carriers		DL Reference Measurement Channel R.10 TDD	As specified in section A.3.1.2.2
on se	nel bandwidth for cells condary carriers	MHz	10	Channel bandwidth for cells on secondary component carrier
	CH parameters for cells condary carrier		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
parar	PCFICH/PDCCH/PHICH parameters for cells on secondary carrier		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
A2	Hysteresis		-96	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.
	Time To Trigger	S	0	

Note 1: See Table A.8.16.2.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.21.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz

Parameter	Unit	Cell 1			Cell 2		Cell 3			
		T1	T2	Т3	T1	T2	Т3	T1	T2	Т3
BW _{channel}	MHz		20			10		10		
OCNG Patterns										
defined in A.3.2.2.7		(OP.7 TDD		(OP.2 TDD		О	P.2 TDD	
(OP.7 TDD) and in			-							
A.3.2.2.2 (OP.2 TDD)										
N _{oc} Note 2	dBm/15 kHz		-104				-10)4		
RSRP Note 3	dBm/15 kHz	-85	-85	-107	-85	-85	-107	-infinity	-85	-107
Ê _s /I _{ot}	dB	19	19	-3	19.00	-0.05	-4.76	-infinity	-0.05	-4.76
SCH_RP Note 3	dBm/15 kHz	-85	-85	-107	-85	-85	-107	-infinity	-85	-107
Ê _s /N _{oc}	dB	19	19	-3	19	19	-3	-infinity	19	-3
Note: See Table A.8	3.16.2.1-2 for oth	er cell-spe	cific test pa	arameters	S.					

A.8.16.21.2 Test Requirements

The test requirements defined in section A.8.16.2.2 shall apply to this test case.

A.8.16.22 E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 20MHz+10MHz

A.8.16.22.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.16.4. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.16.22.1-1 and A.8.16.22.1-2 will replace the values of corresponding parameters in Tables A.8.16.4.1-1 and A.8.16.4.1-2.

Table A.8.16.22.1-1: General test parameters for E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 20MHz+10MHz

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carrier (BW _{channel})	MHz	20	Channel bandwidth for cells on primary component carrier
PDSCH parameters for cells on primary carriers		DL Reference Measurement Channel R.3 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters for cells on primary carriers		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Channel bandwidth for cells on secondary carriers (BW _{channel})	MHz	10	Channel bandwidth for cells on secondary component carrier
PDSCH parameters for cells on secondary carrier		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters for cells on secondary carrier		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2

Note 1: See Table A.8.16.4.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.22.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 20MHz+10MHz

Parameter	Unit	Unit Cel		С	ell 2	Cell 3		
		T1	T1 T2 T1 T2		T1	T2		
BW _{channel}	MHz		20		10)	
OCNG Patterns defined in A.3.2.2		OP.	7 TDD	OP.	2 TDD	OP.2	TDD	
Note: See Table A.8.16.4.1-2 for other cell-specific test parameters.								

A.8.16.22.2 Test Requirements

The test requirements defined in section A.8.16.4.2 shall apply to this test case.

A.8.16.23 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD

A.8.16.23.1 Test Purpose and Environment

The purpose of this test is to verify that in TDD-FDD CA with PCell in FDD the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements for SCell stated in clause 8.3.3.2.1 and the requirements for PCell stated in clause 8.3.2.

In this test case there are 3 cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the PCell on the FDD primary component carrier, Cell 2 is the configured and deactivated SCell on the TDD secondary component carrier, and Cell 3 is the neighbor cell on the TDD secondary component carrier. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At the beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

The test parameters are given in Table A.8.16.23.1-1 and A.8.16.23.1-2 below.

Table A.8.16.23.1-1: General test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in FDD

	Parameter	Unit	Value	Comment
E-UT	RA RF Channel		1, 2	Two radio channels are used for this test
Num	ber		•	
	e PCell		Cell 1	Primary cell on RF channel number 1.
Conf	igured deactivated		Cell 2	Configured deactivated secondary cell on
SCel			Cell 2	RF channel number 2.
Neigl	hbour cell		Cell 3	Neighbor cell to be identified on RF
			Cell 3	channel number 2.
	ength		Normal	
	cial subframe		6	As specified in table 4.2-1 in TS 36.211.
	guration			The same configuration in TDD cells
	k-downlink		1	As specified in table 4.2-2 in TS 36.211.
	guration		•	The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm		Actual RSRP threshold for event A2.
			-98	Needs to take absolute accuracy tolerance
			00	in clause 9.1.11.1 into account plus
				margin.
	Time To Trigger	S	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB		Offset parameter for evaluation of event
			-6	A6. Needs to take relative accuracy
			0	tolerance in clause 9.1.11.2 into account
				plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	individual offset for cells	dB	0	Individual offset for cells on primary
	F channel number 1			component carrier.
	individual offset for cells	dB	0	Individual offset for cells on secondary
_	F channel number 2			component carrier.
	coefficient		0	L3 filtering is not used
	I measurement cycle	ms	320	
	sCycleSCell)		320	
T1		s	5	During this time the UE shall be aware of
			J	cells 1 and 2 but not cell 3.
T2		S	≤12	UE shall report Event A6 within 6.4s
			212	(20xscellMeasCycle)
Т3		S	5	UE shall report Event A2 within 200 ms
		1	3	and 1.6s for cells 1 and 2, respectively.

Table A.8.16.23.1-2: Cell specific test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in FDD

Parameter	Unit Cell 1 Cell 2								Cell 3				
		T1	T2	Т3	T1	T2	Т3	T1	T2	T3			
E-UTRA RF			1				2						
Channel Number		5 1		0.5			58411 NI	0.5					
BW _{channel}			1Hz: N _{RB,c} =				5MHz: N _{RE}						
			MHz: N _{RB,c} =		10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$								
DDCCII			1Hz: N _{RB,c} =				ZUIVIHZ: IN _{RI}	_{3,c} = 100					
PDSCH			MHz: R.5 FI										
parameters: DL Reference			MHz: R.0 F MHz: R.4 F					_					
Measurement		20	IVII 12. IX. 4 I	DD		_		_					
Channel													
PCFICH/PDCCH/		5M	1Hz: R.11 F	DD	5M	1Hz: R.11 T	DD	5MH	z: R.11 T	DD			
PHICH			MHz: R.6 F			MHz: R.6 T			Hz: R.6 T				
parameters:			лнz: R.10 F			инz: R.10 Т			lz: R.10 l				
DL Reference													
Measurement													
Channel													
OCNG Patterns		5MI	Hz: OP.15 F	-DD	5M	Hz: OP.10 7	ΓDD	5MHz	z: OP.10	TDD			
defined			ЛHz: OP.1 F			/Hz: OP.2 1			lz: OP.2				
			IHz: OP.11			/Hz: OP.8 Т			lz: OP.8				
PBCH_RA	dB												
PBCH_RB	dB												
PSS_RA	dB												
SSS_RA	dB												
PCFICH_RB	dB												
PHICH_RA	dB							0					
PHICH_RB	dB		0			0							
PDCCH_RA	dB												
PDCCH_RB	dB												
PDSCH_RA	dB												
PDSCH_RB	dB												
OCNG_RA ^{Note 1}	dB												
OCNG_RB ^{Note 1}	dB												
Noc Note 2	dBm/15		-104				-104	Ī					
	kHz												
Ê _s /N _{oc}	dB	17	17	-3	17	17	-3	-infinity	17	-3			
Ê _s /I _{ot}	dB	17	17	-3	17	-0.09	-4.76	-infinity	-0.09	-4.76			
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-87	-87	-107	-infinity	-87	-107			
SCH_RP Note 3	dBm/15	-87	-87	-107	-87	-87	-107	-infinity	-87	-107			
	kHz							-					
lo Note 3	dBm/Ch	-59.13	-59.13	-74.45	-59.17	-56.13	-73.20						
	BW	+10log	+10log	+10log	+10log	+10log	+10log	Specifie	d in colur	nns for			
		$(N_{RB,c}$	$(N_{RB,c}$	$(N_{RB,c}$	$(N_{RB,c}$	(N _{RB,c}	(N _{RB,c}		Cell 2				
		/50)	/50)	/50)	/50)	/50)	/50)						
Propagation Condition			AWGN			ETU70			ETU70				
Correlation Matrix			1x2 Low			1x2 Low			1x2 Low				
and Antenna													
Configuration													
Timing offset to Cell 1	μs		-			0			3				
Time alignment	μs		-			≤ TAE			N/A				
error relative to cell 1 Note 5	F												
	1	i			Ī			I					

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

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

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

Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.16.23.2 Test Requirements

The UE shall send one Event A6 triggered measurement report for cell 3 with a measurement reporting delay of less than 6.4s (20×measCycleSCell) from the beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 200 ms from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1.6s ($5 \times$ measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to 2×TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD

A.8.16.24.1 Test Purpose and Environment

The purpose of this test is to verify that in TDD-FDD CA with PCell in TDD the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements for SCell stated in clause 8.3.3.2.1 and the requirements for PCell stated in clause 8.3.2.

In this test case there are 3 cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the PCell on the TDD primary component carrier, Cell 2 is the configured and deactivated SCell on the FDD secondary component carrier, and Cell 3 is the neighbor cell on the FDD secondary component carrier. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At the beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

The test parameters are given in Table A.8.16.24.1-1 and Table A.8.16.24.1-2.

Table A.8.16.24.1-1: General test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in TDD

	Parameter	Unit	Value	Comment
E-UT	RA RF Channel		1, 2	Two radio channels are used for this test
Numl	ber			
	e PCell		Cell 1	Primary cell on RF channel number 1.
Conf	igured deactivated		Cell 2	Configured deactivated secondary cell on
SCel			Cell 2	RF channel number 2.
Neigl	hbour cell		Cell 3	Neighbor cell to be identified on RF
			Cell 5	channel number 2.
CP le			Normal	
	cial subframe		6	As specified in table 4.2-1 in TS 36.211.
	guration		<u> </u>	
	k-downlink		1	As specified in table 4.2-2 in TS 36.211.
	guration		-	
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm		Actual RSRP threshold for event A2.
			-98	Needs to take absolute accuracy tolerance
			-30	in clause 9.1.11.1 into account plus
				margin.
	Time To Trigger	S	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB		Offset parameter for evaluation of event
			-6	A6. Needs to take relative accuracy
			-0	tolerance in clause 9.1.11.2 into account
				plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
Cell-i	individual offset for cells	dB	0	Individual offset for cells on primary
on R	F channel number 1		U	component carrier.
Cell-i	individual offset for cells	dB	0	Individual offset for cells on secondary
on R	F channel number 2		U	component carrier.
Filter	coefficient		0	L3 filtering is not used
SCel	I measurement cycle	ms	220	
	sCycleSCell)		320	
T1	•	S	-	During this time the UE shall be aware of
			5	cells 1 and 2 but not cell 3.
T2		s	-140	UE shall report Event A6 within 6.4s
			≤12	(20×scellMeasCycle)
T3		s	5	UE shall report Event A2 within 200 ms
10			E	

Table A.8.16.24.1-2: Cell specific test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in TDD

Parameter	eter Unit Cell 1 Cell 2								Cell 3			
		T1	T2	T3	T1	T2	T3	T1	T2	T3		
E-UTRA RF Channel Number			1				2					
BW _{channel}		101	1Hz: N _{RB,c} = MHz: N _{RB,c} = 1Hz: N _{RB,c} =	= 50			5MHz: N _{RI} 10MHz: N _F 20MHz: N _{RI}	$_{\rm B,c} = 50$				
PDSCH			<u>птг. тчкв,с –</u> ИНz: R.4 Т[ZUIVII IZ. INRI	3,c = 100				
parameters: DL Reference Measurement Channel		10	MHz: R.0 T MHz: R.3 T	DD		-			-			
PCFICH/PDCCH/ PHICH			1Hz: R.11 T MHz: R.6 T			1Hz: R.11 F MHz: R.6 F			z: R.11 F			
parameters: DL Reference Measurement Channel			МНz: R.10 Т			ин г к.о г ИНz: R.10 F		10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Patterns defined		101	IHz: OP.9 T MHz: OP.1	ΓDD	101	Hz: OP.16 F MHz: OP.2 F	DD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
PBCH_RA	dB	∠∪\\	//Hz: OP.7	טטו	∠UIV	IHz: OP.12	רטט	∠UIVIH	z. UP.12	רטט		
PBCH_RB	dB	1										
PSS_RA	dB											
SSS_RA	dB	}										
PCFICH_RB	dB	1										
PHICH_RA	dB	}										
PHICH_RB	dB		0			0			0			
PDCCH_RA	dB	1	Ü			Ü			J			
PDCCH_RB	dB	ł										
PDSCH_RA	dB	1										
PDSCH RB	dB	1										
OCNG_RA ^{Note 1}	dB											
OCNG RR ^{Note 1}	dB											
N _{oc} Note 2	dBm/15 kHz		-104				-104	<u> </u> 				
Ê _s /N _{oc}	dB	17	17	-3	17	17	-3	-infinity	17	-3		
Ês/lot	dB	17	17	-3	17	-0.09	-4.76	-infinity	-0.09	-4.76		
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-87	-87	-107	-infinity	-87	-107		
SCH_RP Note 3	dBm/15 kHz	-87	-87	-107	-87	-87	-107	-infinity	-87	-107		
lo Note 3	dBm/Ch BW	-59.13 +10log (N _{RB,c} /50)	-59.13 +10log (N _{RB,c} /50)	-74.45 +10log (N _{RB,c} /50)	-59.17 +10log (N _{RB,c} /50)	-56.13 +10log (N _{RB,c} /50)	-73.20 +10log (N _{RB,c} /50)	Specifie	Specified in columns for Cell 2			
Propagation Condition			AWGN			ETU70		ETU70				
Correlation Matrix and Antenna Configuration			1x2 Low		1x2 Low			1x2 Low				
Timing offset to Cell 1	μs		-			0			3			
Time alignment error relative to cell 1 Note 5	μs		-			≤TAE		N/A				
Note 1: OCNG s	hall be use	d cuch that	all colle are	fully alloca	tod and a co	netant total	transmittae	I nower che	ctral dans	sity ic		

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

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

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

Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.16.24.2 Test Requirements

The UE shall send one Event A6 triggered measurement report for cell3 with a measurement reporting delay of less than 6.4s ($20 \times$ measCycleSCell) from the beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 200 ms from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1.6s ($5 \times$ measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to 2×TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.25 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD

A.8.16.25.1 Test Purpose and Environment

The purpose of this test is to verify that in TDD-FDD CA with PCell in FDD the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 and the requirements for PCell stated in clause 8.3.2 while at the same time fulfilling the requirement on interruption rate.

In this test case there are three cells: Cell1, Cell2 and Cell3. Cell 1 is the PCell on the FDD primary component carrier, Cell 2 is the configured and deactivated SCell on the TDD secondary component carrier, and Cell 3 is the neighbor cell on the TDD secondary component carrier. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with duration of T1 and T2, respectively. During T1 the UE shall not have any information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. PDCCH indicating a new transmission on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

The test parameters are given in Table A.8.16.25.1-1 and Table A.8.16.25.1-2 below.

Table A.8.16.25.1-1: General test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in FDD

	Parameter	Unit	Value	Comment
E-UT Numl	RA RF Channel ber		1, 2	Two radio channels are used for this test
Activ	e PCell		Cell 1	Primary cell on RF channel number 1.
SCel			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neigl	nbour cell		Cell 3	Neighbor cell to be identified on RF channel number 2.
CP le	ength		Normal	
	ial subframe guration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in TDD cells
	k-downlink guration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	ndividual offset for cells F channel number 1	dB	0	Individual offset for cells on primary component carrier.
	ndividual offset for cells F channel number 2	dB	0	Individual offset for cells on secondary component carrier.
Filter	coefficient		0	L3 filtering is not used
	I measurement cycle sCycleSCell)	ms	1280	
Ť1		S	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤30	UE shall report Event A6 within 25.6s (20xscellMeasCycle)

Table A.8.16.25.1-2: Cell specific test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in FDD

Parameter	Unit	Ce	II 1	Ce	II 2	Ce	II 3			
		T1	T2	T1	T2	T1	T2			
E-UTRA RF Channel Number			1		2					
BW _{channel}		10MHz: I	$I_{RB,c} = 25$ $I_{RB,c} = 50$ $I_{RB,c} = 100$		$5MHz: N_{RB,c} = 25$ $10MHz: N_{RB,c} = 50$ $20MHz: N_{RB,c} = 100$					
PDSCH parameters: DL Reference Measurement Channel		5MHz: I 10MHz:	R.5 FDD R.0 FDD R.4 FDD			-				
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		10MHz:	1.11 TDD R.6 TDD R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				
OCNG Patterns defined		10MHz: C	P.20 FDD P.10 FDD P.17 FDD	10MHz: 0	P.10 TDD DP.2 TDD DP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				
PBCH_RA	dB									
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB		1		1	0				
PCFICH_RB	dB]	0		,	J				
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									

PDCCH_RB	dB						1	
-								
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
Noc Note 2	dBm/15	-1	01		-101			
	kHz							
Ê _s /N _{oc}	dB	16	16	16	16	-infinity	16	
Ê _s /I _{ot}	dB	16	16	16	-0.11	-infinity	-0.11	
RSRP Note 3	dBm/15	-85	-85	-85	-85	-infinity	-85	
	kHz					,		
SCH_RP Note 3	dBm/15	-85	-85	-85	-85	-infinity	-85	
	kHz					,		
lo Note 3	dBm/Ch	-57.11	-57.11	-57.11	-54.15	0 % 1:		
	BW	+10log	+10log	+10log	+10log	Specified in		
		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	Cel	12	
Propagation			GN .		GN	AW	GN	
Condition								
Correlation Matrix		1x2	Low	1x2	Low	1x2	Low	
and Antenna								
Configuration								
Timing offset to	μs		-	()	3		
Cell 1	μο					Ŭ		
Time alignment	μs		-	≤ T	AE	N/A		
error relative to	μο							
cell 1 Note 5								

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
- Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.25.2 Test Requirements

The UE shall send one Event A6 triggered measurement report for cell 3, with a measurement reporting delay less than 25.6s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.26 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD

A.8.16.26.1 Test Purpose and Environment

The purpose of this test is to verify that in TDD-FDD CA with PCell in TDD the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 and the requirements for PCell stated in clause 8.3.2 while at the same time fulfilling the requirement on interruption rate.

In this test case there are three cells: Cell1, Cell2 and Cell3. Cell 1 is the PCell on the TDD primary component carrier, Cell 2 is the configured and deactivated SCell on the FDD secondary component carrier, and Cell 3 is the neighbor cell on the FDD

secondary component carrier. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with duration of T1 and T2, respectively. During T1 the UE shall not have any information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. PDCCH indicating a new transmission on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

The test parameters are given in Table A.8.16.26.1-1 and Table A.8.16.26.1-1 below.

Table A.8.16.26.1-1: General test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in TDD

	Parameter	Unit	Value	Comment
E-UT	RA RF Channel		1, 2	Two radio channels are used for this test
Num	ber			
Activ	e PCell		Cell 1	Primary cell on RF channel number 1.
SCel			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neigl	hbour cell		Cell 3	Neighbor cell to be identified on RF channel number 2.
CP le	ength		Normal	
	ial subframe guration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in TDD cells
Uplin	k-downlink guration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	individual offset for cells F channel number 1	dB	0	Individual offset for cells on primary component carrier.
	ndividual offset for cells F channel number 2	dB	0	Individual offset for cells on secondary component carrier.
Filter	coefficient		0	L3 filtering is not used
	I measurement cycle sCycleSCell)	ms	1280	<u> </u>
T1		S	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		S	≤30	UE shall report Event A6 within 25.6s (20xscellMeasCycle)

Table A.8.16.26.1-2: Cell specific test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in TDD

Parameter	Unit	Ce	II 1	Ce	ell 2	Cell 3				
		T1	T2	T1	T2	T1	T2			
E-UTRA RF Channel Number			1		2					
BW _{channel}		10MHz: N	$R_{RB,c} = 25$ $R_{RB,c} = 50$ $R_{RB,c} = 100$		$5MHz: N_{RB,c} = 25$ $10MHz: N_{RB,c} = 50$ $20MHz: N_{RB,c} = 100$					
PDSCH parameters: DL Reference Measurement Channel		5MHz: F 10MHz:	R.4 TDD R.0 TDD R.3 TDD		-	-				
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		10MHz:	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		R.11 FDD R.6 FDD R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Patterns defined		10MHz: 0	P.9 TDD)P.1 TDD)P.7 TDD	10MHz: 0	P.16 FDD OP.2 FDD OP.12 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
PBCH_RA	dB									
PBCH_RB	dB]								
PSS_RA	dB]								
SSS_RA	dB]	0		0	0				
PCFICH_RB	dB		,		O					
PHICH_RA	dB									
PHICH_RB	dB]								
PDCCH_RA	dB									

PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG RB ^{Note 1}	dB							
Noc Note 2	dBm/15 kHz	-1	01		-101			
Ê _s /N _{oc}	dB	16	16	16	16	-infinity	16	
Ê _s /I _{ot}	dB	16	16	16	-0.11	-infinity	-0.11	
RSRP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85	
SCH_RP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85	
lo Note 3	dBm/Ch BW	-57.11 +10log (N _{RB,c} /50)	-57.11 +10log (N _{RB,c} /50)	-57.11 +10log (N _{RB,c} /50)	-54.15 +10log (N _{RB,c} /50)	Specified in columns for Cell 2		
Propagation Condition		AW		AW		AWGN		
Correlation Matrix and Antenna Configuration		1x2	Low	1x2	Low	1x2 Low		
Timing offset to Cell 1	μs		-	(0	3		
Time alignment error relative to cell 1 Note 5	μs		•	≤T	AE	N/	A	

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
- Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.26.2 Test Requirements

The UE shall send one Event A6 triggered measurement report for cell 3, with a measurement reporting delay less than 25.6s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.A.8.16.27 3 DL PCell in FDD CA Event Triggered Reporting with 2 Deactivated SCells in Non-DRX

A.8.16.27.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1.

The test parameters are given in Tables A.8.16.27.1-1 and A.8.16.27.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A1 (for only SCell1 i.e. cell2), A2 (PCell and SCells) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 4. At the beginning of T2 the transmission power of cell 4 is increased to the same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of cells 1, 2, 3 and 4 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2 and for Cell 3.

Table A.8.16.27.1-1: General test parameters for E-UTRAN TDD-FDD 3 DL CA event triggered reporting under fading propagation conditions with 2 configured but deactivated SCells in non-DRX with PCell in FDD

	Parameter	Unit	Value	Comment
E-UT	RA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Activ	e PCell		Cell 1	Primary cell on RF channel number 1.
Conf	gured deactivated SCell		Cell 2	Configured deactivated secondary cell on RF
Coll	gured deactivated Scell		Cell 2	channel number 2.
Conf	gured deactivated SCell		Cell 3	Configured deactivated secondary cell on RF
Con	gureu deactivateu Scell		Cell 3	channel number 3.
Neid	nbour cell		Cell 4	Neighbour cell to be identified on RF channel
				number 3.
CP le	ength		Normal	
DRX			OFF	Continuous monitoring of primary cell
1				As specified in table 4.2-1 in TS 36.211. The
Spec	ial subframe configuration		6	same configuration applies to all TDD cells
				(cell2, cell3 and cell4).
				As specified in table 4.2-2 in TS 36.211. The
Uplin	k-downlink configuration		1	same configuration applies to all TDD cells
				(cell2, cell3 and cell4).
	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
				Actual RSRP threshold for event A1. Needs to
A1	Threshold RSRP	dBm	-98	take absolute accuracy tolerance in section
				9.1.11.1 into account plus margin.
	Time To Trigger	S	0	
	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
				Actual RSRP threshold for event A2. Needs to
A2	Threshold RSRP	dBm	-98	take absolute accuracy tolerance in section
				9.1.11.1 into account plus margin.
	Time To Trigger	S	0	
	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
			_	Offset parameter for evaluation of event A6.
A6	Offset	dB	-6	Needs to take relative accuracy tolerance in
7.10				section 9.1.11.2 into account plus margin.
	Report on leave		False	
0 "	Time To Trigger	S	0	
	ndividual offset for cells on	dB	0	Individual offset for cells on primary component
	hannel number 1	_		carrier.
	ndividual offset for cells on	dB	0	Individual offset for cells on secondary
	hannel number 2			component carrier.
	ndividual offset for cells on	dB	0	Individual offset for cells on secondary
	hannel number 3			component carrier.
	coefficient		0	L3 filtering is not used
	I measurement cycle	ms	320	
(mea	sCycleSCell)			During this time the cells and cells of the
Т4			F	During this time the cell1 and cell3 shall be
T1		S	5	known to the UE; but cell2 and cell 4 shall be
				unknown to the UE.
T2		s	≤12	UE should report Event A1 for cell2 and event
				A6 for cell4 within 6.4s (20xscellMeasCycle)
T3		S	5	UE should report Event A2 within 200 ms. 1.6s,
				and 1.6s for cells 1, 2 and 3, respectively.

Table A.8.16.27.1-2: Cell specific test parameters for E-UTRAN TDD-FDD 3 DL CA event triggered reporting under fading propagation conditions with 2 configured but deactivated SCells in non-DRX with PCell in FDD

Parameter	Unit		Cell 1			Cell 2			Cell 3			Cell 4		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel Number			1			2					3			
BW _{channel}			Hz: N _{RB,c} =			Hz: N _{RB,c} =					$N_{RB,c} = 25$			
			1Hz: N _{RB,c}			IHz: N _{RB,c} :					$N_{RB,c} = 50$			
			Hz: N _{RB,c} =		20MI	Hz: N _{RB,c} =	= 100			20MHz: N	$N_{RB,c} = 100$			
PDSCH parameters:			1Hz: R.5 F			-			-			-		
DL Reference		10MHz: R.0 FDD												
Measurement		20MHz: R.4 FDD												
Channel PCFICH/PDCCH/PHI		C N 41	II D 44 F	-DD	C N 41	I D 44 T			I I D 44 T	<u> </u>	C N 41	I D 44 T	.00	
CH parameters:			Hz: R.11 F ИHz: R.6 F			Hz: R.11 T //Hz: R.6 T			Hz: R.11 Т ИНz: R.6 Т			Hz: R.11 T //Hz: R.6 T		
DL Reference			ипz. к.о г 1Hz: R.10			//////////////////////////////////////			ипz. к.о і 1Hz: R.10			//////////////////////////////////////		
Measurement		2010	II IZ. K. IU	гоо	2010	II IZ. K. IU	טטו	2010	II IZ. K. IU	טטו	2010	II IZ. K. IU	טטו	
Channel														
OCNG Patterns		5ME	lz: OP.15	FDD	5ME	lz: OP.10	TDD	5MF	lz: OP.10	TDD	5MHz: OP.10 TDD			
oono i allomo		10MHz: OP.1 FDD 10MHz: OP.2 TDD 10MHz: OP.2 TDD							Hz: OP.2					
			Hz: OP.11				z: OP.8 TDD 20MHz: OP.8 TDD					20MHz: OP.8 TDD		
PBCH RA	dB													
PBCH_RB	dB													
PSS_RA	dB													
SSS_RA	dB													
PCFICH_RB	dB													
PHICH_RA	dB													
PHICH_RB	dB		0			0			0			0		
PDCCH_RA	dB													
PDCCH_RB	dB													
PDSCH_RA	dB													
PDSCH_RB	dB													
OCNG_RANote 1	dB													
OCNG_RB ^{Note 1}	dB													
Note 2	dBm/15 KHz		-104			-104	1		ı		04			
Ê _s /N _{oc}	dB	17	17	-3	-infinity	17	-3	17	17	-3	-infinity	17	-3	
Ê _s /I _{ot} Note 3	dB	17	17	-3	-infinity	17	-3	17	-0.09	-4.76	-infinity	-0.09	-4.76	
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-87	-107	-87	-87	-107	-infinity	-87	-107	
SCH_RP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-87	-107	-87	-87	-107	-infinity	-87	-107	
10	dBm/Ch BW	-59.13	-59.13	-74.45	-76.22	-59.13	-74.45	-59.13	-56.17	-73.20				
		+10log	+10log	+10log	+10log	+10log	+10log	+10log	+10log	+10log	Specifi	Specified in columns		
		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)		Cell 3		
Propagation Condition		730)	AWGN	730)	/30)	ETU70	730)	730)	ETU70	/30)		ETU70		
Correlation Matrix and			1x2			1x2 Low			1x2 Low			1x2 Low		
Antenna Configuration									2011					

Timing offset to Cell 1	μs	-	0	0	3
Time alignment error relative to cell 1 Note 5	μs	-	≤ TAE	≤ TAE	N/A
Time alignment error relative to cell 2 Note 5	μs	-	-	≤ TAE	N/A

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 3: Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.27.2 Test Requirements

The UE shall send one Event A6 triggered measurement report for cell 4 with a measurement reporting delay of less than 6.4s (20×measCycleSCell) from the beginning of time T2.

The UE shall send one Event A1 triggered measurement report for Cell 2 with a measurement reporting delay of less than 6.4s (20×measCycleSCell from beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 200 ms from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1.6s ($5 \times$ measCycleSCell) from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 3 with a measurement reporting delay of less than 1.6s ($5 \times$ measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to 2×TTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.28 3 DL PCell in TDD CA Event Triggered Reporting with 2 Deactivated SCells in Non-DRX

A.8.16.28.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1.

The test parameters are given in Tables A.8.16.28.1-1 and A.8.16.28.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A1 (for only SCell1 i.e. cell2), A2 (PCell and SCells) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 4. At the beginning of T2 the transmission power of cell 4 is increased to the same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of cells 1, 2, 3 and 4 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2 and for Cell 3.

Table A.8.16.28.1-1: General test parameters for E-UTRAN TDD-FDD 3 DL CA event triggered reporting under fading propagation conditions with 2 configured but deactivated SCells in non-DRX with PCell in TDD

	Parameter	Unit	Value	Comment
E-U	FRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on
				RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on
				RF channel number 3.
Neig	Neighbour cell		Cell 4	Neighbour cell to be identified on RF
				channel number 3.
	ength		Normal	
DRX			OFF	Continuous monitoring of primary cell
Spec	cial subframe configuration		_	As specified in table 4.2-1 in TS 36.211.
			6	The same configuration applies to TDD
				cell (cell1).
Uplir	nk-downlink configuration		4	As specified in table 4.2-2 in TS 36.211.
			1	The same configuration applies to TDD
Λ 1	Lhyatarasia	٩D	0	cell (cell1).
A1	Hysteresis Threshold RSRP	dB dBm	0 -98	Hysteresis for evaluation of event A1. Actual RSRP threshold for event A1.
	Threshold RSRP	ubiii	-90	Needs to take absolute accuracy tolerance
				in section 9.1.11.1 into account plus
				margin.
	Time To Trigger	S	0	margin.
A2	Hysteresis	dB	0	Hysteresis for evaluation of events A1 A2.
/ _	Threshold RSRP	dBm	-98	Actual RSRP threshold for events A2.
	Threshold Reiki	abiii	30	Needs to take absolute accuracy tolerance
				in section 9.1.11.1 into account plus
				margin.
	Time To Trigger	S	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event
				A6. Needs to take relative accuracy
				tolerance in section 9.1.11.2 into account
				plus margin.
	Report on leave		False	
	Time To Trigger	s dB	0	
	Cell-individual offset for cells on		0	Individual offset for cells on primary
	channel number 1			component carrier.
	individual offset for cells on	dB	0	Individual offset for cells on secondary
	channel number 2			component carrier.
	individual offset for cells on	dB	0	Individual offset for cells on secondary
	RF channel number 3			component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	320	
	(measCycleSCell)		5	During this time the call4 and call2 about he
T1		S	5	During this time the cell1 and cell3 shall be
				known to the UE; but cell2 and cell 4 shall be unknown to the UE.
T2		-	<10	UE should report Event A1 for cell2 and
12		S	≤12	event A6 for cell4 within 6.4s
				(20×scellMeasCycle)
T3			5	UE should report Event A2 within 200 ms.
13		S	3	1.6s, and 1.6s for cells 1, 2 and 3,
				respectively.
				respectively.

Table A.8.16.28.1-2: Cell specific test parameters for E-UTRAN TDD-FDD 3

DL CA event triggered reporting under fading propagation

conditions with 2 configured but deactivated SCells in non-DRX with PCell in TDD

Parameter	Unit		Cell 1		Cell 2 Cell 3			Cell 4					
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1		2		<u> </u>			3				
BW _{channel}		5MHz: N _{RB,c} = 25			5MHz: N _{RB,c} = 25		5MHz: N			$N_{RB,c} = 25$	$I_{RB,c} = 25$		
		10MHz: $N_{RB,c} = 50$		10MHz: $N_{RB,c} = 50$						$N_{RB,c} = 50$			
			Hz: N _{RB,c} =		20MHz: N _{RB,c} = 100		= 100			20MHz: N	$N_{RB,c} = 100$		
PDSCH parameters:		5MHz: R.4 TDD				-			-			-	
DL Reference		10MHz: R.0 TDD											
Measurement		20MHz: R.3 TDD											
Channel PCFICH/PDCCH/PHI		C N 41	II D 44 T	<u> </u>	C N 41	I D 44 F	-DD	- T. A	I I =	-DD	C N 41	U=. D 44 F	.DD
CH parameters:			Hz: R.11 T		5MHz: R.11 FDD		5MHz: R.11 FDD				Hz: R.11 F ИHz: R.6 F		
DL Reference		10MHz: R.6 TDD 20MHz: R.10 TDD		10MHz: R.6 FDD 20MHz: R.10 FDD		10MHz: R.6 FDD 20MHz: R.10 FDD			ипz. к.о г IHz: R.10				
Measurement		2010	II IZ. N. IU	טטו	2010	II IZ. K. IU	гоо	2010	II IZ. K. IU	רטט	2010	II IZ. K. IU I	טט
Channel													
OCNG Patterns		5MHz: OP.9 TDD		5MHz: OP.16 FDD		5MHz: OP.16 FDD			5MHz: OP.16 FDD				
			Hz: OP.1			Hz: OP.2		10MHz: OP.2 FDD		10MHz: OP.2 FDD			
		20MHz: OP.7 TDD		20MHz: OP.12 FDD		20MHz: OP.12 FDD		20MHz: OP.12 FDD					
PBCH_RA	dB												
PBCH_RB	dB												
PSS_RA	dB												
SSS_RA	dB												
PCFICH_RB	dB	1											
PHICH_RA	dB				1			1					
PHICH_RB	dB		0		0		0		0				
PDCCH_RA	dB												
PDCCH_RB	dB	7											
PDSCH_RA	dB												
PDSCH_RB	dB												
OCNG_RA ^{Note 1}	dB												
OCNG_RB ^{Note 1}	dB												
Note 2	dBm/15 KHz		-104		-104					104			
Ê _s /N _{oc}	dB	17	17	-3	-infinity	17	-3	17	17	-3	-infinity	17	-3
Ê _s /I _{ot} Note 3	dB	17	17	-3	-infinity	17	-3	17	-0.09	-4.76	-infinity	-0.09	-4.76
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-87	-107	-87	-87	-107	-infinity	-87	-107
SCH_RP Note 3 Io Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-87	-107	-87	-87	-107	-infinity	-87	-107
IO '''	dBm/Ch BW	-59.13	-59.13	-74.45	-76.22	-59.13	-74.45	-59.13	-56.17	-73.20	0 10 10		,
		+10log	+10log	+10log	+10log	+10log	+10log			Specifi	Specified in columns for		
		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)		Cell 3	
Propagation Condition		/30)	AWGN	730)	730)	ETU70	730)	730)	ETU70 ETU70				
Correlation Matrix and			1x2			1x2 Low			1x2 Low 1x2 Low				
Antenna Configuration									2011				

Timing offset to Cell 1	μs	-	0	0	3
Time alignment error relative to cell 1 Note 5	μs	-	≤ TAE	≤ TAE	N/A
Time alignment error relative to cell 2 Note 5	μs	-	-	≤ TAE	N/A

- OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 1:
- Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as Note 2: AWGN of appropriate power for Noc to be fulfilled.
- Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes. They are not settable parameters themselves. The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3:
- Note 4:
- Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation. Note 5:

A.8.16.28.2 Test Requirements

The UE shall send one Event A6 triggered measurement report for cell 4 with a measurement reporting delay of less than 6.4s (20×measCycleSCell) from the beginning of time T2.

The UE shall send one Event A1 triggered measurement report for Cell 2 with a measurement reporting delay of less than 6.4s (20×measCycleSCell from beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 200 ms from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1.6s ($5 \times$ measCycleSCell) from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 3 with a measurement reporting delay of less than 1.6s (5× measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.29 3 DL FDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX

A.8.16.29.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects Events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1.

The test parameters are given in Tables A.8.16.29.1-1 and A.8.16.29.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A1 (SCell 1), Events A2 (PCell and SCell 1/2) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 4. Immediately at beginning of T2 the transmission power of cell 2 is increased above a threshold value such that this shall result in reporting of Event A1 for SCell 1, and cell 4 is increased to the same level as for Cell 3. Due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2, 3 and 4 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell 1/2, respectively.

Table A.8.16.29.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

	Parameter	Unit	Value	Comment
	RA RF Channel		1, 2, 3	Three radio channels are used for this test
Num				
	e PCell		Cell 1	Primary cell on RF channel number 1.
SCel	igured deactivated I		Cell 2 (SCell 1)	Configured deactivated secondary cell 1 on RF channel number 2.
			Cell 3 (SCell 2)	Configured deactivated secondary cell 2 on RF channel number 3.
Neig	hbour cell		Cell 4	Neighbor cell to be identified on RF channel number 3.
CP le	enath		Normal	onamie manie e
DRX			OFF	Continuous monitoring of primary cell
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin. No event A1 reporting is configured for cell 1 and 3.
	Time To Trigger	S	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.
	Time To Trigger	S	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	-
	Time To Trigger	S	0	
	individual offset for cells F channel number 1	dB	0	Individual offset for cells on primary component carrier.
	individual offset for cells F channel number 2	dB	0	Individual offset for cells on secondary component carrier 1.
Cell-i	ndividual offset for cells F channel number 3	dB	0	Individual offset for cells on secondary component carrier 2.
	coefficient		0	L3 filtering is not used
	I measurement cycle sCycleSCell) for SCell d 2	ms	320	
T1		s	5	During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4.
T2		S	≤12	UE should report Event A1 within 1.6s (5xscellMeasCycle) UE should report Event A6 within 6.4s (20xscellMeasCycle)
Т3		S	5	UE should report Event A2 within 200 ms and 1.6s for cells 1, 2 and 3, respectively.

Table A.8.16.29.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit		Cell 1			Cell 2			Cell 3		Cell 4				
		T1	T2	T3	T1	T2	Т3	T1	T2	Т3	T1	T2	T3		
E-UTRA RF Channel			1		_	2		_			3				
Number															
BW _{channel}			Hz: N _{RB,c} =			Hz: N _{RB,c} =					$I_{RB,c} = 25$				
			IHz: N _{RB,c} :			IHz: N _{RB,c} :					$N_{RB,c} = 50$				
			Hz: N _{RB,c} =		20M	Hz: N _{RB,c} =	: 100			20MHz: N	$I_{RB,c} = 100$				
PDSCH parameters:			IHz: R.5 F			-			-			-			
DL Reference			/Hz: R.0 F												
Measurement		201	⁄IHz: R.4 F	סט											
Channel									5 4 : -						
PCFICH/PDCCH/PHI			Hz: R.11 F			Hz: R.11 F			Hz: R.11 F			Hz: R.11 F			
CH parameters:			/Hz: R.6 F			ИНz: R.6 F			MHz: R.6 F			1Hz: R.6 I			
DL Reference		2010	IHz: R.10 I	רטט	2010	1Hz: R.10 I	-טט	2010	1Hz: R.10	רטט	20M	Hz: R.10	רטט		
Measurement															
Channel OCNG Patterns		ENAI	lz: OP.15	EDD	ENAL	lz: OP.16	EDD	ENAL	lz: OP.16	EDD	ENALI	z: OP.16	EDD		
OCING Patterns			Hz: OP.15			Hz: OP.16			Hz: OP.16 IHz: OP.2						
			Hz: OP.11			Hz: OP.12			mz. ОР.2 Hz: ОР.12		10MHz: OP.2 FDD 20MHz: OP.12 FDD				
PBCH_RA	dB	201111			251111	02		251111	0		201111	02			
PBCH_RB	dB	1													
PSS_RA	dB	1													
SSS_RA	dB	1													
PCFICH_RB	dB	1													
PHICH_RA	dB														
PHICH_RB	dB		0			0			0]	0			
PDCCH_RA	dB]				
PDCCH_RB	dB														
PDSCH_RA	dB														
PDSCH_RB	dB														
OCNG_RA ^{Note 1}	dB														
OCNG_RB ^{Note 1}	dB]				
N _{oc} Note $\overline{2}$			-104			-104					04				
Ê _s /N _{oc}	dB	17	17	-3	-infinity	17	-3	17	17	-3	-infinity	17	-3		
Ê _s /I _{ot} Note 3	dB	17	17	-3	-infinity	17	-3	17	-0.09	-4.76	-infinity	-0.05	-4.76		
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-87	-107	-87	-87	-107	-infinity	-87	-107		
SCH_RP Note 3	dBm/15 kHz				-infinity	-87	-107	-87	-87	-107	-infinity	-87	-107		
lo Note 3	dBm/Ch BW							-59.13	-56.17	-73.20					
		+10log +10log +10log +													
		(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	$_{,c}$ $(N_{RB,c}$ $(N_{RB,c}$ $(N_{RB,c}$										
		/50)	/50)	/50)	/50)	/50)	/50)	/50)	/50)	/50)					

Propagation Condition		AWGN	ETU70	ETU70	ETU70
Correlation Matrix and		1x2	1x2 Low	1x2 Low	1x2 Low
Antenna Configuration					
Timing offset to Cell 1	μs	-	0	0	3
Time alignment error relative to cell 1 Note 5	μs	-	≤ TAE	≤ TAE	N/A
Time alignment error relative to cell 2 Note 5	μs	-	-	≤ TAE	N/A

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
- Note 3: Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.29.2 Test Requirements

The UE shall send one Event A6 triggered measurement report for cell 4 with a measurement reporting delay of less than 6.4s (20×measCycleSCell) from the beginning of time T2.

The UE shall send one Event A1 triggered measurement report for Cell 2 with a measurement reporting delay of less than 6.4s (20×measCycleSCell) from beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 200 ms from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1.6s ($5 \times$ measCycleSCell) from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 3 with a measurement reporting delay of less than 1.6s (5× measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.30 3 DL TDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX

A.8.16.30.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects Events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1.

The test parameters are given in Tables A.8.16.30.1-1 and A.8.16.30.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A1 (SCell 1), Events A2 (PCell and SCell 1/2) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 4. Immediately at beginning of T2 the transmission power of cell 2 is increased above a threshold value such that this shall result in reporting of Event A1 for SCell 1, and cell 4 is increased to the same level as for Cell 3. Due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2, 3 and 4 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell 1/2, respectively.

Table A.8.16.30.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

	Parameter	Unit	Value	Comment
	RA RF Channel		1, 2, 3	Three radio channels are used for this test
Num			Cell 1	Drive on Coll on DE sharped graph and
	e PCell		Cell 1	Primary cell on RF channel number 1.
SCel	gured deactivated		Cell 2 (SCell 1)	Configured deactivated secondary cell 1 on RF channel number 2.
			Cell 3 (SCell 2)	Configured deactivated secondary cell 2 on RF channel number 3.
Neigl	nbour cell		Cell 4	Neighbor cell to be identified on RF channel number 3.
CP le	enath		Normal	
DRX	···•		OFF	Continuous monitoring of primary cell
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin. No event A1 reporting is configured for cell 1 and 3.
	Time To Trigger	S	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.
	Time To Trigger	S	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	ndividual offset for cells F channel number 1	dB	0	Individual offset for cells on primary component carrier.
	ndividual offset for cells F channel number 2	dB	0	Individual offset for cells on secondary component carrier 1.
Cell-i	ndividual offset for cells F channel number 3	dB	0	Individual offset for cells on secondary component carrier 2.
	coefficient		0	L3 filtering is not used
SCel	measurement cycle sCycleSCell) for SCell	ms	320	
T1		S	5	During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4.
T2		S	≤12	UE should report Event A1 within 1.6s (5xscellMeasCycle) UE should report Event A6 within 6.4s (20xscellMeasCycle)
Т3		S	5	UE should report Event A2 within 200 ms and 1.6s for cells 1, 2 and 3, respectively.

Table A.8.16.30.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit		Cell 1			Cell 2			Cell 3			Cell 4			
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3		
E-UTRA RF Channel			1			2					3				
Number															
BW _{channel}			Hz: N _{RB,c} =			Hz: N _{RB,c} =					$N_{RB,c} = 25$				
			1Hz: N _{RB,c}			IHz: N _{RB,c}					$N_{RB,c} = 50$				
			Hz: N _{RB,c} =		20M	Hz: N _{RB,c} =	= 100			20MHz: N	$N_{RB,c} = 100$				
PDSCH parameters:			1Hz: R.5 T			-			-			-			
DL Reference			ИHz: R.0 Т												
Measurement		201	ИHz: R.4 1	ΓDD											
Channel															
PCFICH/PDCCH/PHI			Hz: R.11 7			Hz: R.11 7			Hz: R.11 T		5MHz: R.11 TDD				
CH parameters:			ИHz: R.6 7			ИHz: R.6 Т			ИHz: R.6 Т			1Hz: R.6 T			
DL Reference		20N	1Hz: R.10	TDD	20N	IHz: R.10	TDD	20N	1Hz: R.10	TDD	20M	Hz: R.10	TDD		
Measurement															
Channel															
OCNG Patterns			lz: OP.15			lz: OP.16			lz: OP.16			z: OP.16			
			IHz: OP.1			Hz: OP.2			IHz: OP.2		10MHz: OP.2 TDD				
		20MI	Hz: OP.11	טטו	20MI	Hz: OP.12	טטו	20M	Hz: OP.12	טטו	20MHz: OP.12 TDD				
PBCH_RA	dB														
PBCH_RB	dB														
PSS_RA	dB														
SSS_RA	dB														
PCFICH_RB	dB														
PHICH_RA	dB														
PHICH_RB	dB		0			0			0			0			
PDCCH_RA	dB														
PDCCH_RB	dB														
PDSCH_RA	dB														
PDSCH_RB	dB														
OCNG_RA ^{Note 1}	dB														
OCNG_RB ^{Note 1}	dB														
Noc Note 2			-104			-104				-1	04				
Ë _a /N _{aa}	dB	17	17	-3	-infinity	17	-3	17	17	-3	-infinity	17	-3		
Ê _s /I _{ot} Note 3	dB	17	17	-3	-infinity	17	-3	17	-0.09	-4.76	-infinity	-0.05	-4.76		
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-87	-107	-87	-87	-107	-infinity	-87	-107		
SCH_RP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-87	-107	-87	-87	-107	-infinity	-87	-107		
lo Note 3	dBm/Ch BW	-59.13	-59.13	-74.45	-76.22	-59.13	-74.45								
		+10log	+10log	+10log											
		$(N_{RB,c}$	(N _{RB,c}	$(N_{RB,c}$	$_{B,c}$ $N_{RB,c}$ $N_{RB,c}$ $N_{RB,c}$,c (N _{RB,c} (N _{RB,c} (N _{RB,c}			Cell 3				
		/50)	/50)	/50)	/50) /50) /50)			/50)	/50)	/50)					

Propagation Condition		AWGN	ETU70	ETU70	ETU70
Correlation Matrix and		1x2 Low	1x2 Low	1x2 Low	1x2 Low
Antenna Configuration					
Timing offset to Cell 1	μs	-	0	0	3
Time alignment error relative to cell 1 Note 5	μs	-	≤ TAE	≤ TAE	N/A
Time alignment error relative to cell 2 Note 5	μs	-	-	≤ TAE	N/A

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
- Note 3: Es/lot, RSRP, SCH_RP and lo have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.30.2 Test Requirements

The UE shall send one Event A6 triggered measurement report for cell 4 with a measurement reporting delay of less than 6.4s (20×measCycleSCell) from the beginning of time T2.

The UE shall send one Event A1 triggered measurement report for Cell 2 with a measurement reporting delay of less than 6.4s (20×measCycleSCell) from beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 200 ms from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1.6s (5× measCycleSCell) from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 3 with a measurement reporting delay of less than 1.6s (5× measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in PDCCH.

A.8.16.31 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD

A.8.16.31.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

The test parameters are given in Table A.8.16.31.1-1 and A.8.16.31.1-2 below. In the test there are four cells: Cell 1, Cell 2, Cell 3 and Cell 4. Cell 1 is PCell on the FDD primary component (RF Channel 1), Cell 2 is SCell on the TDD secondary component (RF Channel 2), and Cell 3 is SCell on the TDD secondary component (RF Channel 3) and Cell 4 is the neighbour cell on the TDD secondary component (RF Channel 3). It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, both Cell2 and Cell3 are deactivated. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6.

At the beginning of T3, the transmission power of Cell 4 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell3 remains deactivated. Immediately at beginning of T4 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell 2 during T4.

Table A.8.16.31.1-1: General test parameters for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD

	Parameter	Unit	Value	Comment
E-UT	RA RF Channel		1 2 2	three radio channels are used for this test
Numl	ber		1, 2, 3	
Activ	e PCell		Cell 1	Primary cell on RF channel number 1.
Confi	igured deactivated		Cell 2	Configured deactivated secondary cell on
SCel			Gell 2	RF channel number 2.
	igured deactivated		Cell 3	Configured deactivated secondary cell on
SCel			Oeii 3	RF channel number 3.
Neigl	nbour cell		Cell 4	Neighbor cell to be identified on RF
				channel number 3.
CP le			Normal	
	ial subframe		6	As specified in table 4.2-1 in TS 36.211.
	guration		•	The same configuration in TDD cells
	k-downlink		1	As specified in table 4.2-2 in TS 36.211.
	guration			The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB		Offset parameter for evaluation of event
			-3	A6. Needs to take relative accuracy
			· ·	tolerance in clause 9.1.11.2 into account
				plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	ndividual offset for cells	dB	0	Individual offset for cells on primary
	F channel number 1		•	component carrier.
	ndividual offset for cells	dB	0	Individual offset for cells on secondary
	F channel number 2	-		component carrier.
	individual offset for cells	dB	0	Individual offset for cells on secondary
	F channel number 3			component carrier.
	coefficient		0	L3 filtering is not used
	I measurement cycle	ms	1280	
T1		S	5	During this time the UE shall be aware of
			-	cells 1, 2 and 3 but not cell 4.
T2		S	≤30	UE should report Event A6 within 25.6s
To				(20xscellMeasCycle)
T3		S	1	During this time the UE shall activate cell 2
T4		S	≤10	UE should report Event A6 within 6.4s
				(5xscellMeasCycle)

Table A.8.16.31.1-2: Cell specific test parameters for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD

Parameter	Unit		Ce	ell 1			Ce	ell 2			Ce	ell 3		Cell 4				
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	
E-UTRA RF Channel Number				1				2				3			;	3		
BW _{channel}	MHz			$N_{RB,c} = 25$ $N_{RB,c} = 50$ $N_{RB,c} = 100$			10MHz:	$N_{RB,c} = 25$ $N_{RB,c} = 50$ $N_{RB,c} = 100$)		10MHz:	$N_{RB,c} = 25$ $N_{RB,c} = 50$ $N_{RB,c} = 100$			10MHz: I	$I_{RB,c} = 25$ $N_{RB,c} = 50$ $I_{RB,c} = 100$		
PDSCH parameters: DL Reference Measurement Channel			5MHz: 10MHz:	R.7 FDD R.3 FDD R.6 FDD		N/A	N/A	N/A	5MHz: R.4 TDD 10MHz : R.0 TDD 20MHz : R.3 TDD		۸	I/A			N			
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel			10MHz:	R.11 FDD R.6 FDD R.10 FDD			10MHz:	R.11 TDD R.6 TDD R.10 TDD	.55		10MHz:	R.11 TDD R.6 TDD R.10 TDD			10MHz:	1.11 TDD R.6 TDD R.10 TDD		
OCNG Pattern defined in A.3.2.1 and A.3.2.2			5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD				5MHz: OP.10 TDD 10MHz : OP.2 TDD 20MHz : OP.8 TDD	5MHz: OP.10 TDD 10MHz : OP.2 TDD 20MHz : OP.8 TDD	5MHz: OP.9 TDD 10MHz : OP.1 TDD 20MHz : OP.7 TDD		10MHz:	P.10 TDD OP.2 TDD OP.8 TDD			10MHz: (P.10 TDD DP.2 TDD DP.8 TDD		
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB	dB		0					0				0			()		

OCNG_RA ^{Note 1}	dB																
OCNG_RB ^{Note 1}	dB																
N_{oc} Note 3	dBm/15 kHz		-1	01			-1	01					-1	01			
\hat{E}_s/N_{oc}	dB	16	16	16	16	16	16	16	16	16	16	16	16	-Infinity	16	-Infinity	16
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	-Infinity	-0.11	-Infinity	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
Io Note 3	dBm/Ch BW	-57.11 +10log (N _{RB,c} /50)	-54.15 +10log (N _{RB,c} /50)														
Propagation Condition			ÁW	GN				'GN	,	,	ÁW	'GN	,	,	ÁW	GN	
Antenna Configuration			1)	x2			1:	x2			1:	x2		1x2			
Timing offset to Cell 1	μs			-				0				0		3			
Time alignment error relative to cell 1 Note 5	μs		-				≤ TAE			≤ TAE					N	/A	
Time alignment error relative to cell 2 Note 5	μs		-			-			≤ TAE					N	/A		

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

The resources for uplink transmission are assigned to the UE on cell1 prior to the start of time period T2 and on cell2 prior to the start of time period T4. Note 2:

Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Note 3: N_{oc} to be fulfilled.

RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation. Note 4:

Note 5:

A.8.16.31.2 Test Requirements

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25.6s (20×scellMeasCycle) from the beginning of time period T2.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 6.4s (5×scellMeasCycle) from the beginning of time period T4.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the start of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.32 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD

A.8.16.32.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

The test parameters are given in Table A.8.16.32.1-1 and A.8.16.32.1-2 below. In the test there are four cells: Cell 1, Cell 2, Cell 3 and Cell 4. Cell 1 is PCell on the TDD primary component (RF Channel 1), Cell 2 is SCell on the FDD secondary component (RF Channel 2), and Cell 3 is SCell on the FDD secondary component (RF Channel 3) and Cell 4 is the neighbour cell on the FDD secondary component (RF Channel 3). It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, both Cell2 and Cell3 are deactivated. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6.

At the beginning of T3, the transmission power of Cell 4 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell3 remains deactivated. Immediately at beginning of T4 the transmission power of Cell 4 is increased to same level as for Cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell2 during T4.

Table A.8.16.32.1-1: General test parameters for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD

	Parameter	Unit	Value	Comment				
E-UT	RA RF Channel		1, 2, 3	Three radio channels are used for this test				
Numl	ber							
	e PCell		Cell 1	Primary cell on RF channel number 1.				
	igured SCell		Cell 2	Configured secondary cell on RF channel number 2.				
	igured SCell		Cell 3	Configured secondary cell on RF channel number 3.				
	nbour cell		Cell 4	Neighbor cell to be identified on RF channel number 3.				
CP le			Normal					
config	ial subframe guration on PCell		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.				
	k-downlink guration on PCell		1					
DRX			OFF	Continuous monitoring of primary cell				
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.				
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.				
	Report on leave		False					
	Time To Trigger	S	0					
on RI	ndividual offset for cells F channel number 1	dB	0	Individual offset for cells on primary component carrier.				
	ndividual offset for cells F channel number 2	dB	0	Individual offset for cells on secondary component carrier.				
	ndividual offset for cells F channel number 3	dB	0	Individual offset for cells on secondary component carrier.				
Filter	coefficient		0	L3 filtering is not used				
SCell	I measurement cycle	ms	1280					
T1		S	5	During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4.				
T2		S	≤30	UE should report Event A6 within 25.6s (20xscellMeasCycle)				
Т3		S	1	During this time the UE shall activate cell 2				
T4		Ø	≤10	UE should report Event A6 within 6.4s (5xscellMeasCycle)				
NOTI	E: This test verifies the	RRM re	quirement which	ch is independent of channel bandwidth and is				

NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.32.1-2: Cell specific test parameters for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD

Parameter	Unit		Ce	ell 1			Ce	ell 2			C	ell 3		Cell 4						
		T1	T2	Т3	T4	T1	T2	Т3	T4	T1	T2	Т3	T4	T1	T2	T3	T4			
E-UTRA RF				1				2				3				3				
Channel Number																				
BW _{channel}	MHz			$N_{RB,c} = 25$				$N_{RB,c} = 25$			5MHz: I	$N_{RB,c} = 25$				$N_{RB,c} = 25$				
			10MHz:					$N_{RB,c} = 50$			10MHz:	$N_{RB,c} = 50$)	10MHz: $N_{RB,c} = 50$						
			20MHz: N		0			$N_{RB,c} = 100$				$N_{RB,c} = 10$	0	20MHz: N _{RB,c} = 100						
PDSCH				R.4 TDD		N/A	N/A	N/A	5MHz:		1	I/A			N	I/A				
parameters:				R.0 TDD					R.7											
DL Reference			20MHz:	R.3 TDD					FDD											
Measurement									10MHz											
Channel									: R.3											
									FDD											
									20MHz											
									: R.6 FDD											
PCFICH/PDCCH/P			<i>EN1</i> ∐→. [R.11 TDD			ENALIZ: D	I R.11 FDD	ן דטט		ENALI I	R.11 FDD			5MU E	2 11 EDD				
HICH parameters				R.6 TDD					R.6 FDD		5MHz: R.11 FDD									
riiori parameters			-	-				R.6 FDD			-	R.10 FDD		10MHz: R.6 FDD						
OCNG Pattern			20MHz: R.10 TDD 20MHz: R.10 FDD 5MHz: OP.9 TDD 5MHz: SMHz: SMHz: SMHz: SMHz: SMHz: DP.19 OP.19 OP.19 OP.20					5MHz·			P.16FDD		20MHz: R.10 FDD 5MHz: OP.16FDD;							
defined in A.3.2.1)P.2 FDD		5MHz: OP.16FDD; 10MHz:OP.2 FDD;								
doiniod in 7 (.O.2.)			20MHz: OP. 7 TDD FD				FDD;	FDD;	FDD;						OP.12FDD					
				10MHz 10MHz 10MHz 10MHz					J	_	201011 12. 01 .121 00									
						:OP.6	:OP.6	:OP.6	:OP.10											
						FDD;	FDD;	FDD;	FDD;											
						20MHz	20MHz	20MHz	20MHz											
						:	:	:	: OP.17											
						OP.14	OP.14	OP.14	FDD											
						FDD	FDD	FDD												
PBCH_RA	dB																			
PBCH_RB	dB																			
PSS_RA	dB																			
SSS_RA	dB																			
PCFICH_RB	dB																			
PHICH_RA	dB			0				0				0				0				
PHICH_RB	dB			0				0				U				U				
PDCCH_RA	dB																			
PDCCH_RB	dB																			
PDSCH_RA	dB																			
PDSCH_RB	dB																			
OCNG_RA ^{Note 1}	dB																			
OCNG_RB ^{Note 1}	dB																			

N _{oc} Note 3	dBm/15 kHz		-1	01			-1	01					-1	01			
\hat{E}_s/N_{oc}	dB	16	16	16	16	16	16	16	16	16	16	16	16	-Infinity	16	-Infinity	16
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	-Infinity	-0.11	-Infinity	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
lo Note 3	dBm/Ch BW	-57.11 +10log (N _{RB,c} /50)	-54.15 +10log (N _{RB,c} /50)														
Propagation Condition		,	ÁW	GN	,		ÁW	GN	,	,	ÁW	GN	,			GN	,
Antenna Configuration			1:	ĸ2			1)	K 2			1:	(2			1:	x2	
Timing offset to Cell	μs		,	-			()			()		3			
Time alignment error relative to cell 1 Note5	μs		-				≤T	AE			≤T	AE			N	/A	
Time alignment error relative to cell 2 Note5	μs	-			-			≤ TAE					N	/A			

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

Note 2: The resources for uplink transmission are assigned to the UE on cell1 prior to the start of time period T2 and on cell2 prior to the start of time period T4.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.32.2 Test Requirements

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25.6s (20×scellMeasCycle) from the beginning of time period T2.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 6.4s (5×scellMeasCycle) from the beginning of time period T4.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the beginning of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.33 E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX

A.8.16.33.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

The test parameters are given in Table A.8.16.33.1-1 and A.8.16.33.1-2 below. In the test there are four cells: Cell 1, Cell 2, Cell 3 and Cell 4. Cell 1 is PCell on the FDD primary component (RF Channel 1), Cell 2 is SCell on the FDD secondary component (RF Channel 2), and Cell 3 is SCell on the FDD secondary component (RF Channel 3) and Cell 4 is the neighbour cell on the FDD secondary component (RF Channel 3). It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, both Cell2 and Cell3 are deactivated. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6.

At the beginning of T3, the transmission power of Cell 4 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell3 remains deactivated. Immediately at beginning of T4 the transmission power of Cell 4 is increased to same level as for Cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell2 during T4.

Table A.8.16.33.1-1: General test parameters for E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

	Parameter	Unit	Value	Comment					
E-UT	RA RF Channel		1, 2, 3	Three radio channels are used for this test					
Numl	ber		1, 2, 3						
	e PCell		Cell 1	Primary cell on RF channel number 1.					
	gured deactivated		Cell 2	Configured deactivated secondary cell on					
SCell			OCII Z	RF channel number 2.					
	gured deactivated		Cell 3	Configured deactivated secondary cell on					
SCell			0011 0	RF channel number 3.					
Neigh	nbour cell		Cell 4	Neighbor cell to be identified on RF					
	0.5.1			channel number 3.					
CP le			Normal						
DRX			OFF	Continuous monitoring of primary cell					
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.					
	Offset	dB		Offset parameter for evaluation of event					
			-3	A6. Needs to take relative accuracy					
			J	tolerance in clause 9.1.11.2 into account					
				plus margin.					
	Report on leave		False						
	Time To Trigger	S	0						
	ndividual offset for cells	dB	0	Individual offset for cells on primary					
	F channel number 1		•	component carrier.					
	ndividual offset for cells	dB	0	Individual offset for cells on secondary					
	F channel number 2			component carrier.					
	ndividual offset for cells	dB	0	Individual offset for cells on secondary					
	F channel number 3		•	component carrier.					
—	coefficient		0	L3 filtering is not used					
	I measurement cycle	ms	1280						
T1		S	5	During this time the UE shall be aware of					
			•	cells 1, 2 and 3 but not cell 4.					
T2		S	≤30	UE should report Event A6 within 25.6s					
				(20×scellMeasCycle)					
T3		S	1	During this time the UE shall activate cell 2					
T4		S	≤10	UE should report Event A6 within 6.4s					
				(5xscellMeasCycle)					

Table A.8.16.33.1-2: Cell specific test parameters for E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX (Cell #1 and Cell #2)

Parameter	Unit		Ce	ell 1			Cel	12			Ce	II 3			C	ell 4	
		T1	T2	T3	T4	T1	T2	Т3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel				1			2) -			3	3				3	
Number																	
BW _{channel}				$I_{RB,c} = 25$			5MHz: N				5MHz: N			5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50			
			10MHz: I				10MHz: N				10MHz: N						
DDCCH			20MHz: N		0	NI/A	20MHz: N		CNALL-		20MHz: N _{RB,c} = 100 N/A			20MHz: N _{RB,c} = 100 N/A			00
PDSCH parameters: DL Reference				R.7 FDD R.3 FDD		N/A	N/A	N/A	5MHz: R.7		IN.	/A			ľ	N/A	
Measurement Channel				R.6 FDD					FDD								
Weasurement Chamilei			ZUIVII IZ.	N.0 FDD					10MHz:								
									R.3								
									FDD								
									20MHz:								
									R.6								
									FDD								
PCFICH/PDCCH/PHICH			5MHz: F	R.11 FDD			5MHz: R	.11 FDD			5MHz: R	.11 FDD			5MHz: F	R.11 FD	D
parameters			-	R.6 FDD			10MHz: F				10MHz:				10MHz:		
			20MHz: I				20MHz: R		•		20MHz: F				20MHz:		
OCNG Pattern defined			5MHz: O			5MHz:	5MHz:	5MHz:	5MHz:		5MHz: OI				5MHz: C		
in A.3.2.1			10MHz: C			OP.19	OP.19	OP.19	OP.20		10MHz: C				10MHz:		
			20MHz: C	P.17 FDI	ט	FDD	FDD	FDD	FDD		20MHz: O	P.12 FD	D		20MHz: 0	JP.12 FI	טט
						10MHz: OP.6	10MHz: OP.6FDD	10MHz: OP.6	10MHz: OP.10								
						FDD	20MHz:	FDD	FDD								
						20MHz:	OP.14	20MHz:	20MHz:								
						OP.14	FDD	OP.14	OP.17								
						FDD	1 22	FDD	FDD								
PBCH_RA	dB																
PBCH_RB	dB																
PSS_RA	dB																
SSS_RA	dB																
PCFICH_RB	dB																
PHICH_RA	dB			_			_					_				_	
PHICH_RB	dB		(0			C)			()				0	
PDCCH_RA	dB																
PDCCH_RB	dB																
PDSCH_RA	dB																
PDSCH_RB	dB																
OCNG_RA ^{Note 1}	dB																
OCNG_RB ^{Note 1}	dB																

$N_{oc}^{ m Note~3}$	dBm/15 kHz		-1	01			-10)1					-1	01			
\hat{E}_s/N_{oc}	dB	16	16	16	16	16	16	16	16	16	16	16	16	- Infinity	16	- Infinity	16
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	- Infinity	-0.11	- Infinity	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	- Infinity	-85	- Infinity	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	- Infinity	-85	- Infinity	-85
lo Note 3	dBm/Ch BW	-57.11 +10log (N _{RB,c} /50)	-54.15 +10log (N _{RB,c} /50)	-57.11 +10log (N _{RB,c} /50)	-54.15 +10log (N _{RB,c} /50)	-57.11 +10log (N _{RB,c} /50)	-54.15 +10log (N _{RB,c} /50)	-57.11 +10log (N _{RB,c} /50)	-54.15 +10loς (N _{RB,c} /50)								
Propagation Condition			AW	/GN			AW	GN			ΑW	/GN			AW	'GN	
Antenna Configuration			1:	x2			1x	2			1	x2			1:	x2	
Timing offset to Cell 1	μs			-		0			0					;	3		
Time alignment error relative to cell 1 Note 5	μs			-		≤ TAE			≤TAE					N	/A		
Time alignment error relative to cell 2 Note 5	μs			-		-			≤TAE				N/A				

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

Note 2: The resources for uplink transmission are assigned to the UE on cell1 from the start of time period T2 and on cell2 from the start of time period T4.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.33.2 Test Requirements

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25.6s (20×scellMeasCycle) from the beginning of time period T2.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 6.4s (5×scellMeasCycle) from the beginning of time period T4.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the beginning of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.34 E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX

A.8.16.34.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

The test parameters are given in Table A.8.16.34.1-1 and A.8.16.34.1-2 below. In the test there are four cells: Cell 1, Cell 2, Cell 3 and Cell 4. Cell 1 is PCell on the TDD primary component (RF Channel 1), Cell 2 is SCell on the TDD secondary component (RF Channel 2), and Cell 3 is SCell on the TDD secondary component (RF Channel 3) and Cell 4 is the neighbour cell on the TDD secondary component (RF Channel 3). It is indicated to the UE in the measurement control information that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, both Cell2 and Cell3 are deactivated. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6.

At the beginning of T3, the transmission power of Cell 4 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell3 remains deactivated. Immediately at beginning of T4 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell 2 during T4.

Table A.8.16.34.1-1: General test parameters for E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

	Parameter	Unit	Value	Comment
	RA RF Channel		1, 2, 3	three radio channels are used for this test
Numl				
	e PCell		Cell 1	Primary cell on RF channel number 1.
	igured deactivated		Cell 2	Configured deactivated secondary cell on
SCel				RF channel number 2.
	igured deactivated		Cell 3	Configured deactivated secondary cell on
SCel	hbour cell			RF channel number 3.
iveigi	nbour cell		Cell 4	Neighbor cell to be identified on RF channel number 3.
CP le	anath .		Normal	Channel number 5.
	cial subframe			As specified in table 4.2-1 in TS 36.211.
	guration		6	The same configuration in both cells
	k-downlink			As specified in table 4.2-2 in TS 36.211.
	guration		1	The same configuration in both cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB		Offset parameter for evaluation of event
			-3	A6. Needs to take relative accuracy
			9	tolerance in clause 9.1.11.2 into account
				plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	individual offset for cells	dB	0	Individual offset for cells on primary
	F channel number 1	ID	-	component carrier.
	individual offset for cells	dB	0	Individual offset for cells on secondary
	F channel number 2 individual offset for cells	dB		component carrier.
		aв	0	Individual offset for cells on secondary
	F channel number 3 coefficient		0	component carrier. L3 filtering is not used
	I measurement cycle	ms	1280	L3 lillering is not used
T1	i measurement cycle	S		During this time the UE shall be aware of
' '		3	5	cells 1, 2 and 3 but not cell 4.
T2		S		UE should report Event A6 within 25.6s
			≤30	(20×scellMeasCycle)
T3		s	1	During this time the UE shall activate cell 2
T4		S	-10	UE should report Event A6 within 6.4s
			≤10	(5×scellMeasCycle)

Table A.8.16.34.1-2: Cell specific test parameters for E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Parameter	Unit		Ce	ell 1			Ce	ell 2			C	ell 3		Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF				1				2				3				3	
Channel Number																	
BW _{channel}	MHz		5MHz: N					$N_{RB,c} = 25$			5MHz: I	$N_{RB,c} = 25$;			$N_{RB,c} = 25$	
			10MHz:					$N_{RB,c} = 50$				$N_{RB,c} = 50$				$N_{RB,c} = 50$	
			20MHz: N						20MHz: N _{RB,c} = 100				$20MHz: N_{RB,c} = 100$				
PDSCH				R.4 TDE		N/A	N/A	N/A	5MHz:		1	N/A			N	I/A	
parameters:			10MHz:						R.4								
DL Reference			20MHz: R.3 TDD						TDD								
Measurement									10MHz								
Channel									: R.0								
									TDD								
									20MHz								
									: R.3 TDD								
PCFICH/PDCCH/P			5MHz: F	2 11 TD	`			<u> </u> R.11 TDD	טטון		5MU	R.11 TDD	\		5MU 0	R.11 TDD	
HICH parameters:			10MHz:					R.6 TDD				R.6 TDD				R.6 TDD	
DL Reference			20MHz:	_			-	R.10 TDD			-	R.10 TDE			-	R.10 TDD	
Measurement			ZUIVII IZ.	11.10 10	D		ZUIVII IZ.	11.10 100			ZUIVII IZ.	11.10 101	,		ZUIVII IZ.	11.10 100	
Channel																	
OCNG Pattern			5MHz: C	OP 9 TD	<u> </u>	5MHz:	5MHz:	5MHz:	5MHz:		5MHz: C	P.10 TDI)		5MHz: O	P.10 TDD	
defined in A.3.2.2			10MHz: (OP.10	OP.10	OP.10	OP.9			OP.2 TDI				OP.2 TDD	
			20MHz: (TDD	TDD	TDD	TDD			OP.8 TDI				OP.8 TDD	
			-			10MHz	10MHz	10MHz	10MHz		-				-		
						: OP.2	: OP.2	: OP.2	: OP.1								
						TDD	TDD	TDD	TDD								
						20MHz	20MHz	20MHz	20MHz								
						: OP.8	: OP.8	: OP.8	: OP.7								
						TDD	TDD	TDD	TDD								
PBCH_RA	dB	_															
PBCH_RB	dB	_															
PSS_RA	dB	_															
SSS_RA	dB																
PCFICH_RB	dB	_															
PHICH_RA	dB	_		0				0				^				^	
PHICH_RB	dB	_		0				0				0				0	
PDCCH_RA	dB	_															
PDCCH_RB	dB	_															
PDSCH_RA	dB	_															
PDSCH_RB	dB																
OCNG_RA ^{Note 1}	dB																

OCNG_RB ^{Note 1}	dB																
$N_{oc}^{$	dBm/15 kHz		-10	01			-101			-101							
\hat{E}_s/N_{oc}	dB	16	16	16	16	16	16	16	16	16	16	16	16	-Infinity	16	-Infinity	16
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	-Infinity	-0.11	-Infinity	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
lo ^{Note 3}	dBm/Ch BW	-57.11 +10log (N _{RB,c} /50)	-54.15 +10log (N _{RB,c} /50)														
Propagation Condition		,	ÁW	GN	,			'GN	,			GN	,	,		GN	,
Antenna Configuration			1>	(2			1:	x2		1x2				1x2			
Timing offset to Cell 1	μs		-	-		0			0				3				
Time alignment error relative to cell 1 Note 5	μs		-	•		≤TAE			≤ TAE				N/A				
Time alignment error relative to cell 2 Note 5	μs	-				,	-		≤ TAE			N/A					

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

Note 2: The resources for uplink transmission are assigned to the UE on cell1 prior to the start of time period T2 and on cell2 prior to the start of time period T4.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.34.2 Test Requirements

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25.6s (20×scellMeasCycle) from the beginning of time period T2.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 6.4s (5×scellMeasCycle) from the beginning of time period T4.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the start of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.16.35 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX

A.8.16.35.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7 for UE configured with two downlink SCells, when the SCell is known by the UE at the time of activation and PCell is in FDD.

The test parameters are given in Tables A.8.16.35.1-1 and cell-specific parameters in A.8.16.35.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. All cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and deactivated Cell 3 (SCell2) on radio channel 3 (SCC2) but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell1 (Cell 2) becomes configured on radio channel 2 (SCC1). The UE now starts monitoring also the SCC1. The test equipment sends a MAC message for activation of the SCell1.

The point in time at which the MAC message is received at the UE antenna connector, in a subframe # denoted m which is an even number, defines the start of time period T2. At the beginning of T2 the test equipment sends a MAC message for activation of the SCell1. The UE receives the SCell2 activation command in a subframe (m+10) during activation of the SCell1. The UE shall be able to report valid CSI for the activated SCell1 at latest in subframe (m+29). The UE shall start reporting CSI for SCell1 in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCells shall occur in the subframes (m+5) to (m+9) and (m+15) to (m+19).

Time period T3 starts when a MAC message for deactivation of SCell1, sent from the test equipment to the UE in a subframe # denoted n which is an even number, is received at the UE antenna connector. The test equipment sends a MAC message for deactivation of the SCell2 in subframe (n+10). The UE shall carry out deactivation of the SCell1 at latest in subframe (n+8), and any PCell interruption due to the deactivation of SCells shall occur in the subframes (n+5) to (n+9) and (n+15) to (n+19).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell1, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell1 activation command is sent until a CSI report with other than CQI index 0 is received.

Table A.8.16.35.1-1: General test parameters for known SCell1 activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	S	7	During this time the PCell and SCell2 shall be known and the SCell1 configured and detected.
T2	S	1	During this time the UE shall activate the SCell1.
T3	S	1	During this time the UE shall deactivate the SCell1.

Table A.8.16.35.1-2: Cell specific test parameters for E-UTRAN TDD known SCell1 activation with PCell in FDD

Parameter	Unit	Cell 1	Cell 2	Cell 3	
		T1 T2 T3	T1 T2 T3	T1 T2 T3	
E-UTRA RF Channel		1	2	3	
Number					
BW _{channel}	MHz	5MHz: $N_{RB,c} = 25$	5MHz: N _{RB,c} = 25	5MHz: $N_{RB,c} = 25$	
		$10MHz: N_{RB,c} = 50$	10MHz: $N_{RB,c} = 50$	$10MHz: N_{RB,c} = 50$	
		$20MHz: N_{RB,c} = 100$	20MHz: N _{RB,c} = 100	20MHz: $N_{RB,c} = 100$	
PDSCH parameters:		5MHz: R.7 FDD	-	-	
DL Reference		10MHz: R.3 FDD			
Measurement Channel		20MHz: R.6 FDD			
PCFICH/PDCCH/PHIC		5MHz: R.11 FDD	5MHz: R.11 TDD	5MHz: R.11 TDD	
H parameters:		10MHz: R.6 FDD	10MHz: R.6 TDD	10MHz: R.6 TDD	
DL Reference		20MHz: R.10 FDD	20MHz: R.10 TDD	20MHz: R.10 TDD	
Measurement Channel			-1411 OD 40 TDD	-1111 00 10 700	
OCNG Patterns		5MHz: OP.20 FDD	5MHz: OP.10 TDD	5MHz: OP.10 TDD	
		10MHz: OP.10 FDD	10MHz: OP.2 TDD 20MHz: OP.8 TDD	10MHz: OP.2 TDD 20MHz: OP.8 TDD	
BBOLL BA	15	20MHz: OP.17 FDD	201VII 12. OI .0 100	201VII 12. OI .0 1DD	
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0	0	0	
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
Noc Note 2	dBm/15	-104	-104	-104	
<u> </u>	kHz				
Ê _s /N _{oc}	dB	17	17	17	
Ê _s /I _{ot}	dB	17	17	17	
RSRP Note 3	dBm/15	-87	-87	-87	
COLL DD Note 3	kHz		07	~=	
SCH_RP Note 3	dBm/15	-87	-87	-87	
lo Note 3	kHz	50.40	50.40	50.10	
10	dBm/Ch	-59.13	-59.13	-59.13	
	BW	+10log	+10log	+10log	
Dropogation Condition		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	
Propagation Condition		AWGN	AWGN	AWGN	
Antenna Configuration		1x2	1x2	1x2	
Timing offset to Cell 1	μs	-	0	0	
Time alignment error	μs	-	≤ TAE	≤ TAE	
relative to cell 1 Note 5				. T^ =	
Time alignment error	μs	-	-	≤ TAE	
relative to cell 2 Note 5					

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

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

Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.35.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8), or in a subframe (m+10) if the subframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+29).

During T3 the UE shall stop sending CSI reports for SCell1 at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9) and outside the subframes (m+15) to (m+19).

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9) and outside the subframes (n+15) to (n+19).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+29) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.36 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX

A.8.16.36.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7 for UE configured with two downlink SCells, when the SCell is known by the UE at the time of activation and PCell is in TDD.

The test parameters are given in Tables A.8.16.36.1-1 and cell-specific parameters in A.8.16.36.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. All cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and deactivated Cell 3 (SCell2) on radio channel 3 (SCC2) but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell1 (Cell 2) becomes configured on radio channel 2 (SCC1). The UE now starts monitoring also the SCC1. The test equipment sends a MAC message for activation of the SCell1.

The point in time at which the MAC message is received at the UE antenna connector, in a subframe # denoted m, where m is 4 or 9, defines the start of time period T2. At the beginning of T2 the test equipment sends a MAC message for activation of the SCell1. The UE receives the SCell2 activation command in a subframe (m+15) during activation of the SCell1. The UE shall be able to report valid CSI for the activated SCell1 at latest in a subframe (m+29). The UE shall start reporting CSI for SCell1 in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCells shall occur in the subframes (m+5) to (m+11) and (m+20) to (m+26).

Time period T3 starts when a MAC message for deactivation of SCell1, sent from the test equipment to the UE in a subframe # denoted n, where n is 4 or 9, is received at the UE antenna connector. The test equipment sends a MAC message for deactivation of the SCell2 in subframe (n+15). The UE shall carry out deactivation of the SCell1 at latest in subframe (n+8), and any PCell interruption due to the deactivation of SCells shall occur in the subframes (n+5) to (n+11) and (n+20) to (n+26).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell1, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell1 activation command is sent until a CSI report with other than CQI index 0 is received.

Table A.8.16.36.1-1: General test parameters for known SCell1 activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration		1	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC1.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell and SCell2 shall be known and the SCell1 configured and detected.
T2	s	1	During this time the UE shall activate the SCell1.
Т3	s	1	During this time the UE shall deactivate the SCell1.

Table A.8.16.36.1-2: Cell specific test parameters for E-UTRAN FDD known SCell1 activation with PCell in TDD

Parameter	Unit	Cell 1		Cell 2			Cell 3			
		T1 T2	Т3	T1	T2	T3	T1	T2	Т3	
E-UTRA RF Channel		1			2			3		
Number		1			2			3		
BW _{channel}	MHz	5MHz: N _{RB,c} =	25	5MH	z: N _{RB,c} = 2	25	5MF	łz: N _{RB,c} =	25	
		$10MHz: N_{RB,c} =$		10MF	Iz: N _{RB,c} =	50	10M	Hz: N _{RB,c} =	= 50	
		$20MHz: N_{RB,c} =$	100	20MHz: N _{RB,c} = 100			20MF	20MHz: $N_{RB,c} = 100$		
PDSCH parameters:		5MHz: R.4 TDI	0		-			-		
DL Reference		10MHz: R.0 TD								
Measurement Channel		20MHz: R.3 TD	D							
PCFICH/PDCCH/PHIC		5MHz: R.11 T	DC	5MHz: R.11 FDD			5MH	lz: R.11 F	DD	
H parameters:		10MHz: R.6 T	DD	10MI	Hz: R.6 FD	D	10M	IHz: R.6 F	DD	
DL Reference		20MHz: R.10 T	DD	20MF	lz: R.10 F	DD	20MI	Hz: R.10 F	-DD	
Measurement Channel										
OCNG Patterns		5MHz: OP.9 TD		5MHz	:: OP.16 FI	DD	5MH	z: OP.16 F	-DD	
		10MHz: OP.1 TE		10MHz: OP.2 FDD			_	Hz: OP.2 F		
		20MHz: OP.7 TDD		20MHz: OP.12 FDD			20MF	lz: OP.12	FDD	
PBCH_RA	dB							· · · · · · · · · · · · · · · · · · ·		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB	0			0			0		
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH RB	dB									
OCNG_RA ^{Note 1}	dB									
OCNG RB ^{Note 1}	dB									
Noc Note 2	dBm/15 kHz	-104			-104			-104		
Ê _s /N _{oc}	dB	17			17			17		
Ês/lat	dB	17			17			17		
RSRP Note 3	dBm/15 kHz	-87			-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87			-87		
Io Note 3	dBm/Ch BW	-59.13			-59.13			-59.13		
· · ·	32, 3 2	+10log			+10log			+10log		
		(N _{RB,c} /50)		(1	N _{RB,c} /50)		(N _{RB,c} /50)		
Propagation Condition		AWGN		AWGN		,	AWGN			
Antenna Configuration		1x2		1x2			1x2			
Timing offset to Cell 1	μS	-		0				0		
Time alignment error	μς	-		≤ TAE			≤ TAE			
relative to cell 1 Note 5	μο				- · · · · · ·			/ _		
Time alignment error	μS	-			_			≤ TAE		
relative to cell 2 Note 5	μο				-		- 1712			
							L			

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

A.8.16.36.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8,) or in a subframe (m+9) if the subframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+29).

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

Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+11) and outside the subframes (m+20) to (m+26).

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+11) and outside the subframes (n+20) to (n+26).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+29) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.37 3 DL FDD CA activation and deactivation of known SCell in non-DRX

A.8.16.37.1 Test Purpose and Environment

The purpose of this test is to verify that SCell activation and deactivation times are within the requirements stated in clause 7.7 for 3DL FDD carrier aggregation, when the SCells are known by the UE at the time of activation.

The test parameters are given in Tables A.8.16.37-1 and cell-specific parameters in A.8.16.37-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. All cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell1 (Cell 2) becomes configured on radio channel 2 (SCC1). The UE now starts monitoring also the SCC1. The test equipment sends a MAC message for activation of the SCell1.

The point in time at which the MAC message is received at the UE antenna connector, in a subframe # denoted m which is an even number, defines the start of time period T2. At the beginning of T2 the test equipment sends a MAC message for activation of the SCell1. The UE receives the SCell2 activation command in a subframe (m+10) during activation of the SCell1. The UE shall be able to report valid CSIs for the activated SCell1 at latest in asubframe (m+29). The UE shall start reporting CSI for SCell1 in subframe in (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCells shall occur in the subframes (m+5) to (m+9ms) and (m+15) to (m+19).

Time period T3 starts when a MAC message for deactivation of SCell1, sent from the test equipment to the UE in a subframe # denoted n which is an even number, is received at the UE antenna connector. The test equipment sends a MAC message for deactivation of the SCell2 in subframe (n+10). The UE shall carry out deactivation of the SCell1 at latest in subframe (n+8), and any PCell interruption due to the deactivation of SCells shall occur in the subframes (n+5) to (n+9) and (n+15) to (n+19).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCells, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell1 activation command is sent until a CSI report with other than CQI index 0 is received.

Table A.8.16.37-1: General test parameters for E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel		1, 2, 3	Three radio channels are used for this test
Number			
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell		Cell 2	Deconfigured secondary cell on RF
			channel number 2.
Configured deactivated		Cell 3	Configured deactivated secondary cell on
SCell			RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and		0	CQI reporting for SCells every second
offset configuration index		U	subframe
Cell-individual offset for cells	dB	0	Individual offset for cells on PCC.
on RF channel number 1			
Cell-individual offset for cells	dB	0	Individual offset for cells on SCC1.
on RF channel number 2			
Cell-individual offset for cells	dB	0	Individual offset for cells on SCC2.
on RF channel number 3			
Filter coefficient		0	L3 filtering is not used
SCell measurement cycle	ms	320	
(measCycleSCell)			
T1	S	7	During this time the PCell and SCell2 shall
			be known and the SCell1 configured and
			detected.
T2	S	1	During this time the UE shall activate the
			SCell1 and SCell2.
T3	S	1	During this time the UE shall deactivate
			the SCell1 and SCell2.

Table A.8.16.37-2: Cell specific test parameters for E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Cell 1	Cell 2	Cell 3		
		T1 T2 T3	T1 T2 T3	T1 T2 T3		
E-UTRA RF Channel		1	2	3		
Number						
BW _{channel}		5MHz: $N_{RB,c} = 25$	5MHz: $N_{RB,c} = 25$	5MHz: $N_{RB,c} = 25$		
		$10MHz: N_{RB,c} = 50$	10MHz: $N_{RB,c} = 50$	$10MHz: N_{RB,c} = 50$		
		$20MHz: N_{RB,c} = 100$	$20MHz: N_{RB,c} = 100$	$20MHz: N_{RB,c} = 100$		
PDSCH parameters:		5MHz: R.7 FDD	-	-		
DL Reference		10MHz: R.3 FDD				
Measurement Channel		20MHz: R.6 FDD				
PCFICH/PDCCH/PHICH		5MHz: R.11 FDD	5MHz: R.11 FDD	5MHz: R.11 FDD		
parameters:		10MHz: R.6 FDD	10MHz: R.6 FDD	10MHz: R.6 FDD		
DL Reference		20MHz: R.10 FDD	20MHz: R.10 FDD	20MHz: R.10 FDD		
Measurement Channel						
OCNG Patterns		5MHz: OP.20 FDD	5MHz: OP.16 FDD	5MHz: OP.16 FDD		
		10MHz: OP.10 FDD	10MHz: OP.2 FDD	10MHz: OP.2 FDD		
		20MHz: OP.17 FDD	20MHz: OP.12 FDD	20MHz: OP.12 FDD		
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0	0	0		
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
Noc Note 2	dBm/15 kHz	-104	-104	-104		
Ë _s /N _{oc}	dB	17	17	17		
Ê _o /L _{ot} Note 3	dB	17	17	17		
RSRP Note 3	dBm/15 kHz	-87	-87	-87		
SCH RP Note 3	dBm/15 kHz	-87	-87	-87		
lo Note 3	dBm/Ch BW	-59.13+10log	-59.13+10log	-59.13+10log		
		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)		
Propagation Condition		AWGN	AWGN	AWGN		
Antenna Configuration		1x2	1x2	1x2		
Timing offset to Cell 1	μs	-	0	0		
Time alignment error	μs	-	≤TAE	≤ TAE		
relative to cell 1 Note 5	μο					
Time alignment error	μs	-	-	≤ TAE		
relative to cell 2 Note 5	μο					
Note 1: OCNG shall be	used such that a	Il cells are fully allocated	and a constant total transi	mitted nower spectral		

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

A.8.16.37.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8), or in a subframe (m+10) if the subframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+29).

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

Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T3 the UE shall stop sending CSI reports for SCell1 at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9) and outside the subframes (m+15) to (m+19).

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9) and outside the subframes (n+15) to (n+19).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+29) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.38 3 DL TDD CA activation and deactivation of known SCell in non-DRX

A.8.16.38.1 Test Purpose and Environment

The purpose of this test is to verify that SCell activation and deactivation times are within the requirements stated in clause 7.7 for 3DL TDD carrier aggregation, when the SCells are known by the UE at the time of activation.

The test parameters are given in Tables A.8.16.38-1 and cell-specific parameters in A.8.16.38-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. All cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell1 (Cell 2) becomes configured on radio channel 2 (SCC1). The UE now starts monitoring also the SCC1. The test equipment sends a MAC message for activation of the SCell1.

The point in time at which the MAC message is received at the UE antenna connector, in a subframe # denoted m, where m is 4 or 9, defines the start of time period T2. At the beginning of T2 the test equipment sends a MAC message for activation of the SCell1. The UE receives the SCell2 activation command in a subframe (m+15) during activation of the SCell1. The UE shall be able to report valid CSIs for the activated SCell1 at latest in a subframe (m+29). The UE shall start reporting CSI for SCell1 for SCell1 in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCells shall occur in the subframes (m+5) to (m+11) and (m+20) to (m+26).

Time period T3 starts when a MAC message for deactivation of SCell1, sent from the test equipment to the UE, in a subframe # denoted n, where n is 4 or 9, is received at the UE antenna connector. The test equipment sends a MAC message for deactivation of the SCell2 in subframe (n+15). The UE shall carry out deactivation of the SCell1 at latest in subframe (n+8), and any PCell interruption due to the deactivation of SCells shall occur in the subframes (n+5) to (n+11) and (n+20) to (n+26).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCells, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell1 activation command is sent until a CSI report with other than CQI index 0 is received.

Table A.8.16.38-1: General test parameters for E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Value	Comment	
E-UTRA RF Channel		1, 2, 3	Three radio channels are used for this test	
Number				
Active PCell		Cell 1	Primary cell on RF channel number 1.	
Deconfigured SCell		Cell 2	Deconfigured secondary cell on RF channel number 2.	
Configured deactivated SCell		Cell 3	Configured deactivated secondary cell on RF channel number 3.	
CP length		Normal		
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration applies to all cells.	
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration applies to all cells	
DRX		OFF	Continuous monitoring of primary cell	
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCells every UL subframe	
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.	
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.	
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.	
Filter coefficient		0	L3 filtering is not used	
SCell measurement cycle (measCycleSCell)	ms	320		
T1	S	7	During this time the PCell and SCell2 shall be known and the SCell1 configured and detected.	
T2	S	1	During this time the UE shall activate the SCell1 and SCell2.	
Т3	S	1	During this time the UE shall deactivate the SCell1 and SCell2	

Table A.8.16.38-2: Cell specific test parameters for E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Cell 1	Cell 2	Cell 3
		T1 T2 T3	T1 T2 T3	T1 T2 T3
E-UTRA RF Channel Number		1	2	3
BW _{channel}		5MHz: N _{RB,c} = 25	5MHz: N _{RB,c} = 25	5MHz: N _{RB,c} = 25
DVV channel		10MHz: $N_{RB,c} = 50$	$10MHz: N_{RB,c} = 50$	10MHz: $N_{RB,c} = 50$
		20MHz: $N_{RB,c} = 100$	20MHz: $N_{RB,c} = 100$	20MHz: $N_{RB,c} = 100$
PDSCH parameters:		5MHz: R.4 TDD		
DL Reference		10MHz: R.0 TDD		
Measurement Channel		20MHz: R.3 TDD		
PCFICH/PDCCH/PHICH		5MHz: R.11 TDD	5MHz: R.11 TDD	5MHz: R.11 TDD
parameters:		10MHz: R.6 TDD	10MHz: R.6 TDD	10MHz: R.6 TDD
DL Reference		20MHz: R.10 TDD	20MHz: R.10 TDD	20MHz: R.10 TDD
Measurement Channel		2011112111110112	20111121111101122	2011112: 14:10 122
OCNG Patterns		5MHz: OP.9 TDD	5MHz: OP.10 TDD	5MHz: OP.10 TDD
CONC Fallonio		10MHz: OP.1 TDD	10MHz: OP.2 TDD	10MHz: OP.2 TDD
		20MHz: OP.7 TDD	20MHz: OP.8 TDD	20MHz: OP.8 TDD
PBCH_RA	dB	-		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH RA	dB			
PHICH_RB	dB	0	0	0
PDCCH_RA	dB	-	_	_
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG RB ^{Note 1}	dB			
Noc Note 2	dBm/15 kHz	-104	-104	-104
Ê _s /N _{oc}	dB	17	17	17
Ê _s /N _{oc} Ê _s /I _{ot} Note 3	dB	17	17	17
RSRP Note 3	dBm/15 kHz	-87	-87	-87
SCH_RP Note 3	dBm/15 kHz	-87	-87	-87
lo Note 3	dBm/Ch BW	-59.13+10log	-59.13+10log	-59.13+10log
		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)
Propagation Condition		AWGN	AWGN	AWGN
Antenna Configuration		1x2	1x2	1x2
Timing offset to Cell 1	μs	-	0	0
Time alignment error	μS	-	≤ TAE	≤ TAE
relative to cell 1 Note 5	·			
Time alignment error	μs	-	-	≤ TAE
relative to cell 2 Note 5	•			
Note 1. OCNC shall be		II aalla ava fullu allaaatad	and a constant total trans	:44

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

A.8.16.38.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframe (m+8) and (m+9) were subject to interruption when an intra-band SCell is actitivated. Whether CSI report in subframe (m+8) and/or (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) and/or (m+9).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+29).

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

Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T3 the UE shall stop sending CSI reports for SCell1 at latest in subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+11) and outside the subframes (m+20) to (m+26).

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+11) and outside the subframes (n+20) to (n+26).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+29) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.39 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

A.8.16.39.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7 for UE configured with two downlink SCells, when the SCell is unknown by the UE at the time of activation.

The test parameters are given in Tables A.8.16.39.1-1 and cell-specific parameters in A.8.16.39.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. Cell 1 is FDD cell, and Cell 2 and Cell 3 are TDD cells. Cell 1 and Cell 3 have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2) but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the Cell 2 (SCell1) becomes configured on radio channel 2 (SCC1). During T1 Cell 2 (SCell1) is powered off and UE is not aware of Cell 2 (SCell1).

A MAC message for activation of SCell1 is sent by the test equipment 100ms after the RRC message, in a subframe # denoted m which is an even number. The point in time at which the MAC message for activation of Cell 2 (SCell1) is received at the UE antenna connector defines the start of time period T2. Immediately at beginning of T2 the transmission power of Cell 2 (SCell1) is increased to same level as for Cell 1 (PCell). The test equipment sends a MAC message for activation of the Cell 3 (SCell2) in subframe (m+10). Since UE received SCell2 activation command during activation of SCell1, the UE shall be able to report valid CSI for the activated SCell1 at latest in subframe (m+39) provided the SCell1 can be successfully detected on the first attempt. The UE shall start reporting CSI for SCell1 in subframe (m+8), and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCells shall occur in the subframes (m+5) to (m+9) and (m+15) to (m+19).

Time period T3 starts when a MAC message for deactivation of Cell 2 (SCell1), sent from the test equipment to the UE, in a subframe # denoted n which is an even number, is received at the UE antenna connector. The test equipment sends a MAC message for deactivation of the Cell 3 (SCell2) in subframe (n+10). The UE shall carry out deactivation of the Cell 2 (SCell1) at latest in subframe (n+8), and any PCell interruption due to the deactivation of SCells shall occur in subframes (n+5) to (n+9) and (n+10) to (n+19).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell1, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the Cell 2 (SCell1) activation command is sent until a CSI report with other than CQI index 0 is received.

Table A.8.16.39.1-1: General test parameters for unknown SCell1 activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel		1, 2, 3	Three radio channels are used for this test
Number		1, 2, 3	
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated		Cell 2	Deconfigured deactivated secondary cell
SCell1		Oeii 2	on RF channel number 2.
Configured deactivated		Cell 3	Configured deactivated secondary cell on
SCell2		Oeii 3	RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and		0	CQI reporting for SCell every second
offset configuration index		U	subframe
Cell-individual offset for cells	dB	0	Individual offset for cells on PCC.
on RF channel number 1	d d	0	
Cell-individual offset for cells	dB	0	Individual offset for cells on SCC1.
on RF channel number 2	uБ	O	
Cell-individual offset for cells	dB	0	Individual offset for cells on SCC2.
on RF channel number 3	d d	0	
SCell measurement cycle	ms	320	
(measCycleSCell)	1115	320	
T1	ms	100	During this time the PCell and SCell2 shall
	1110	100	be known and the SCell1 configured.
T2		1	During this time the UE shall activate the
	S	ı	SCell1 and SCell2.
T3	S	1	During this time the UE shall deactivate
	0	I	the SCell1 and SCell2.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.39.1-2: Cell specific test parameters for E-UTRAN TDD known SCell1 activation with PCell in FDD

Parameter	Unit	Cell 1		Cell 2	Cell 3		
		T1 T2 T3	T1	T2 T3	T1 T2 T3		
E-UTRA RF Channel Number		1	2		3		
TDD special subframe configuration		-		6	6		
TDD uplink-downlink configuration		-		1	1		
BW _{channel}	MHz	5MHz: N _{RB,c} = 25	5ME	Hz: N _{RB,c} = 25	5MHz: N _{RB,c} = 25		
S . Glanie	2	10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	10MI	Hz: $N_{RB,c} = 50$ Hz: $N_{RB,c} = 100$	10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$		
PDSCH parameters:		5MHz: R.7 FDD		-	-		
DL Reference		10MHz: R.3 FDD					
Measurement Channel		20MHz: R.6 FDD					
PCFICH/PDCCH/PHIC		5MHz: R.11 FDD		lz: R.11 TDD	5MHz: R.11 TDD		
H parameters:		10MHz: R.6 FDD		IHz: R.6 TDD	10MHz: R.6 TDD		
DL Reference		20MHz: R.10 FDD	20MI	Hz: R.10 TDD	20MHz: R.10 TDD		
Measurement Channel		ENIL OD 00 EDD	5 N 41 I	OD 40 TDD	51411 OD 40 TDD		
OCNG Patterns		5MHz: OP.20 FDD		z: OP.10 TDD	5MHz: OP.10 TDD		
		10MHz: OP.10 FDD 20MHz: OP.17 FDD		Hz: OP.2 TDD Hz: OP.8 TDD	10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB		20.711	00 ,00	202. 31 10 122		
PBCH_RB	dB						
PSS_RA	dB				1		
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB	0	0		0		
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1} Noc Note 2	dB	404		404	404		
	dBm/15 kHz	-104		-104	-104		
Ê _s /N _{oc}	dB	17	-infinity	17	17		
Ê _s /I _{ot}	dB	17	-infinity	17	17		
RSRP Note 3	dBm/15 kHz	-87	-infinity	-87	-87		
SCH_RP Note 3	dBm/15 kHz	-87	-infinity -87		-87		
lo Note 3	dBm/Ch	-59.13	-76.22	-59.13	-59.13		
	BW	+10log	+10log	+10log	+10log		
		(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)		
Propagation Condition		AWGN	AWGN		AWGN		
Antenna Configuration		1x2		1x2	1x2		
Timing offset to Cell 1	μs	-		0	0		
Time alignment error relative to cell 1 Note 5	μs	-		≤ TAE ≤ TAE			
Time alignment error relative to cell 2 Note 5	μs	-		-	≤ TAE		

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
- Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
- Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
- Note 6: TDD special subframe configuration and uplink-downlink configuration are as specified in Table 4.2-1 and 4.2-2 in TS36.211 [16]. The same configuration applies to all TDD cells.

A.8.16.39.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell1 at latest in a subframe (m+8), or in a subframe (m+10) if the subframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+39).

During T3 the UE shall stop sending CSI reports for SCell1 at latest in a subframe (n+8).

During T2interruption of PCell during SCells activation shall not happen outside subframes (m+5) to (m+9) and outside the subframes (m+15) to (m+19).

During T3iInterruption of PCell during SCells deactivation shall not happen outside subframes (n+5) to (n+9) and outside subframes (n+15) to (n+19).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+39) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.40 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

A.8.16.40.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7 for UE configured with two downlink SCells, when the SCell is unknown by the UE at the time of activation.

The test parameters are given in Tables A.8.16.40.1-1 and cell-specific parameters in A.8.16.40.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. Cell 1 is TDD cell, and Cell 2 and Cell 3 are FDD cells. Cell 1 and Cell 3 have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2) but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the Cell 2 (SCell1) becomes configured on radio channel 2 (SCC1). During T1 Cell 2 (SCell1) is powered off and UE is not aware of Cell 2 (SCell1).

A MAC message for activation of SCell1 is sent by the test equipment 100ms after the RRC message, in a subframe # denoted m, where m is 4 or 9. The point in time at which the MAC message for activation of Cell 2 (SCell1) is received at the UE antenna connector defines the start of time period T2. Immediately at beginning of T2 the transmission power of Cell 2 (SCell1) is increased to same level as for Cell 1 (PCell). The test equipment sends a MAC message for activation of the Cell 3 (SCell2) in subframe (m+15). Since UE received SCell2 activation command during activation

of SCell1, the UE shall be able to report valid CSI for the activated SCell1 at latest in subframe (m+39) provided the SCell1 can be successfully detected on the first attempt. The UE shall start reporting CSI for SCell1 in subframe (m+8), and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCells shall occur in subframes (m+5) to (m+9) and (m+20) to (m+24).

Time period T3 starts when a MAC message for deactivation of Cell 2 (SCell1), sent from the test equipment to the UE in a subframe # denoted n, where n is 4 or 9, is received at the UE antenna connector. The test equipment sends a MAC message for deactivation of the Cell 3 (SCell2) in subframe (n+15). The UE shall carry out deactivation of the Cell 2 (SCell1) at latest in subframe (n+8), and any PCell interruption due to the deactivation of SCells shall occur in subframes (n+5) to (n+9) and (n+20) to (n+24).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell1, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the Cell 2 (SCell1) activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the subframes from the time when the Cell 2 (SCell1) deactivation command is sent until CQI reporting for SCell1 is discontinued.

Table A.8.16.40.1-1: General test parameters for unknown SCell1 activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel		1, 2, 3	Three radio channels are used for this test
Number		1, 2, 5	
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated		Cell 2	Deconfigured deactivated secondary cell
SCell1		Oeli Z	on RF channel number 2.
Configured deactivated		Cell 3	Configured deactivated secondary cell on
SCell2		Cell 3	RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and		0	CQI reporting for SCell every second
offset configuration index		U	subframe
Cell-individual offset for cells	dB	0	Individual offset for cells on PCC.
on RF channel number 1	ub	0	
Cell-individual offset for cells	dB	0	Individual offset for cells on SCC1.
on RF channel number 2	ub	0	
Cell-individual offset for cells	dB	0	Individual offset for cells on SCC2.
on RF channel number 3	ub	0	
SCell measurement cycle	ms	320	
(measCycleSCell)	1110	020	
T1	ms	100	During this time the PCell and SCell2 shall
	1110	100	be known and the SCell1 configured.
T2	s	1	During this time the UE shall activate the
	3	'	SCell1 and SCell2.
Т3	s	1	During this time the UE shall deactivate
N	3	1	the SCell1 and SCell2.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.16.40.1-2: Cell specific test parameters for E-UTRAN FDD known SCell1 activation with PCell in TDD

E-UTRA RF Channel Number TDD special subframe configuration TDD uplink-downlink		T1 T2 T3	T1	T2 T3	T1 T2 T3	
Number TDD special subframe configuration		1		2	3	
TDD special subframe configuration					3	
		6		-	-	
		1		-	-	
configuration	MHz	EMILE, N. OF	C N AL	I N 05	ENALIS NI OF	
BW _{channel}	IVIHZ	$5MHz: N_{RB,c} = 25$ $10MHz: N_{RB,c} = 50$		Hz: $N_{RB,c} = 25$ Hz: $N_{RB,c} = 50$	$5MHz: N_{RB,c} = 25$ $10MHz: N_{RB,c} = 50$	
		20MHz: $N_{RB,c} = 100$		Hz: $N_{RB,c} = 30$	20MHz: N _{RB,c} = 100	
PDSCH parameters:		5MHz: R.4 TDD	ZOWII	-		
DL Reference		10MHz: R.0 TDD				
Measurement Channel		20MHz: R.3 TDD				
PCFICH/PDCCH/PHIC		5MHz: R.11 TDD	5MH	Hz: R.11 FDD	5MHz: R.11 FDD	
H parameters:		10MHz: R.6 TDD		1Hz: R.6 FDD	10MHz: R.6 FDD	
DL Reference		20MHz: R.10 TDD	20M	Hz: R.10 FDD	20MHz: R.10 FDD	
Measurement Channel		SMIL OR STOR	= 1 41 1	00.40.500	51111 00 10 500	
OCNG Patterns		5MHz: OP.9 TDD		z: OP.16 FDD	5MHz: OP.16 FDD	
		10MHz: OP.1 TDD 20MHz: OP.7 TDD		Hz: OP.2 FDD Hz: OP.12 FDD	10MHz: OP.2 FDD 20MHz: OP.12 FDD	
PBCH_RA	dB					
PBCH_RB	dB				!	
PSS_RA	dB					
SSS_RA	dB				!	
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0	0		0	
PDCCH_RA	dB					
PDCCH_RB	dB				!	
PDSCH_RA	dB					
PDSCH_RB OCNG_RA ^{Note 1}	dB dB				!	
OCNG_RB ^{Note 1}	dB					
	dBm/15	-104		-104	-104	
1400	kHz	101		101		
Ê _s /N _{oc}	dB	17	-infinity	17	17	
Ês/lot	dB	17	-infinity	17	17	
	dBm/15 kHz	-87	-infinity	-87	-87	
_	dBm/15 kHz	-87	-infinity	-87	-87	
lo Note 3	dBm/Ch	-59.13	-76.22	-59.13	-59.13	
	BW	+10log	+10log	+10log	+10log	
		$(N_{RB,c}/50)$	(N _{RB,c} /50)	$(N_{RB,c}/50)$	(N _{RB,c} /50)	
Propagation Condition		AWGN		AWGN	AWGN	
Antenna Configuration		1x2		1x2	1x2	
Timing offset to Cell 1 μs	s	-		0	0	
Time alignment error relative to cell 1 Note 5 μS	s	-	≤ TAE		≤ TAE	
Time alignment error relative to cell 2 Note 5	s	-		-	≤ TAE	

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
- Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
- Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
- Note 6: TDD special subframe configuration and uplink-downlink configuration are as specified in Table 4.2-1 and 4.2-2 in TS36.211 [16]. The same configuration applies to all TDD cells.

A.8.16.40.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell12in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+39).

During T3 the UE shall stop sending CSI reports for SCell1 at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside subframes (m+5) and (m+9) and outside the subframes (m+20) to (m+24).

During T3 interruption of PCell during SCells deactivation shall not happen outside subframes (n+5) to (n+9) and outside subframes (n+20) to (n+24).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in subframe (m+39) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.41 3 DL FDD CA activation and deactivation of unknown SCell in non-DRX

A.8.16.41.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in clause 7.7 for 3DL FDD carrier aggregation, when the SCell is unknown by the UE at the time of activation.

The test parameters are given in Tables A.8.16.41-1 and cell-specific parameters in A.8.16.41-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. Cell 1 and Cell 3 have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the Cell 2 (SCell1) becomes configured on radio channel 2 (SCC1). During T1 the signal level of Cell 2 (SCell1) is powered off and UE is not aware of Cell 2 (SCell1).

A MAC message for activation of the SCell1 is sent by the test equipment 100ms after the RRC message, in a subframe # denoted m which is an even number. The point in time at which the MAC message for activation of Cell 2 (SCell1) is received at the UE antenna connector defines the start of time period T2. Immediately at beginning of T2 the transmission power of Cell 2 (SCell1) is increased to same level as for Cell 1 (PCell). The test equipment sends a MAC message for activation of Cell 3 (SCell2) in subframe (m+10). Since UE received SCell2 activation command during activation of SCell1, the UE shall be able to report valid CSIs for the activated SCell1 at latest in subframe (m+39)

provided the SCell1 can be successfully detected on the first attempt. The UE shall start reporting CSI in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCells shall occur in the subframe (m+5) to (m+9) and (m+15) to (m+19).

Time period T3 starts when a MAC message for deactivation of Cell 2 (SCell1), sent from the test equipment to the UE in a subframe # denoted n, is received at the UE antenna connector. The test equipment sends a MAC message for deactivation of the Cell 3 (SCell2) in subframe (n+10). The UE shall carry out deactivation of Cell 2 (SCell1) at latest in subframe (n+8), and any PCell interruption due to the deactivation shall occur in the subframes (n+5) to (n+9) and (n+15) to (n+19).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCells, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the Cell 2 (SCell1) activation command is sent until a CSI reports with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the subframes from the time when the Cell 2 (SCell1) deactivation command is sent until CQI reporting for SCell1 is discontinued.

Table A.8.16.41-1: General test parameters for E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell1		Cell 2	Deconfigured secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCells every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	ms	100	During this time the PCell and SCell2 shall be known and the SCell1 configured.
T2	S	1	During this time the UE shall activate the SCell1 and SCell2.
ТЗ	S	1	During this time the UE shall deactivate the SCell1 and SCell2.
Note: This test verifies the RRM to the principle defined in s	•		pendent of channel bandwidth and is performed according

Table A.8.16.41-2: Cell specific test parameters for E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Parameter	Unit	Cell 1	Cell 2		Cell 3		
		T1 T2 T3	T1	T2 T3	T1 T2 T3		
E-UTRA RF Channel Number		1		2	3		
BW _{channel}		5MHz: N _{RB,c} = 25	5MHz: N _{RB,c} = 25		5MHz: N _{RB,c} = 25		
		$10MHz: N_{RB,c} = 50$		$N_{RB,c} = 50$	$10MHz: N_{RB,c} = 50$		
		20MHz: N _{RB,c} = 100	20MHz:	$N_{RB,c} = 100$	20MHz: $N_{RB,c} = 100$		
PDSCH parameters:		5MHz: R.7 FDD		-	-		
DL Reference Measurement Channel		10MHz: R.3 FDD 20MHz: R.6 FDD					
PCFICH/PDCCH/PHICH		5MHz: R.11 FDD	5MHz:	R.11 FDD	5MHz: R.11 FDD		
parameters:		10MHz: R.6 FDD		:: R.6 FDD	10MHz: R.6 FDD		
DL Reference Measurement		20MHz: R.10 FDD		R.10 FDD	20MHz: R.10 FDD		
Channel							
OCNG Patterns		5MHz: OP.20 FDD		OP.16 FDD	5MHz: OP.16 FDD		
		10MHz: OP.10 FDD		OP.2 FDD	10MHz: OP.2 FDD		
		20MHz: OP.17 FDD	20MHz:	OP.12 FDD	20MHz: OP.12 FDD		
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB				0		
PHICH_RB	dB	0		0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
N _{oc} Note 2	dBm/	-104	-	104	-104		
<u> </u>	15 kHz						
Ê _s /N _{oc}	dB	17	-infinity	17	17		
Ê _s /I _{ot} Note 3	dB	17	-infinity	17	17		
RSRP Note 3	dBm/ 15 kHz	-87	-infinity	-87	-87		
SCH_RP Note 3	dBm/	-87	-infinity	-87	-87		
	15 kHz						
lo Note 3	dBm/	-59.13+10log	-76.22	-59.13+10log	-59.13+10log		
	Ch BW	(N _{RB,c} /50)	+10log (N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)		
Propagation Condition		AWGN		WGN	AWGN		
Antenna Configuration		1x2		1x2	1x2		
Timing offset to Cell 1	μs	-		0	0		
Time alignment error relative to cell 1 Note 5	μs	-	<u></u>	TAE	≤ TAE		
Time alignment error relative to Cell 2 Note 5	μs	-		-	≤ TAE		

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

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

Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: The time alignment error (TAE) between two cells specified in TS36.104 [30] clause 6.5.3.1 (value depends upon the type of carrier aggregation).

A.8.16.41.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8), or in a subframe (m+10) if the subframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+39).

During T3 the UE shall stop sending CSI reports for SCell1 at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9) and outside the subframes (m+15) to (m+19).

During T2 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9) and outside the subframes (n+15) to (n+19).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+39) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.42 3 DL TDD CA activation and deactivation of unknown SCell in non-DRX

A.8.16.42.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in clause 7.7 for 3DL TDD carrier aggregation, when the SCell is unknown by the UE at the time of activation.

The test parameters are given in Tables A.8.16.42-1 and cell-specific parameters in A.8.16.42-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. Cell 1 and cell 3 have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on redio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the Cell 2 (SCell 1) becomes configured on radio channel 2 (SCC1). During T1 the signal level of Cell 2 (SCell 1) is powered off and UE is not aware of Cell 2 (SCell 1).

A MAC message for activation of the SCell1 is sent by the test equipment 100ms after the RRC message, in a subframe # denoted m, where m is 4 or 9. The point in time at which the MAC message for activation of Cell 2 (SCell1) is received at the UE antenna connector defines the start of time period T2. Immediately at beginning of T2 the transmission power of Cell 2 (SCell1) is increased to same level as for Cell 1 (PCell). The test equipment sends a MAC message for activation of Cell 3 (SCell2) in subframe (m+15). Since UE received SCell2 activation command during activation of SCell1, the UE shall be able to report valid CSIs for the activated SCell1 at latest in subframe (m+39) provided the SCell1 can be successfully detected on the first attempt. The UE shall start reporting CSI in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCells shall occur in the subframes (m+5) to (m+11) and (m+20) to (m+26).

Time period T3 starts when a MAC message for deactivation of Cell 2 (SCell1), sent from the test equipment to the UE in a subframe # denoted n, where n is 4 or 9, is received at the UE antenna connector. The test equipment sends a MAC message for deactivation of the Cell 3 (SCell2) in subframe (n+15). The UE shall carry out deactivation of Cell 2 (SCell1) at latest in subframe (n+8), and any PCell interruption due to the deactivation of SCells shall occur in the subframes (n+5) to (n+11) and (n+20) to (n+26).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCells, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the Cell 2 (SCell1) activation command is sent until a CSI reports with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the subframes from the time when the Cell 2 (SCell1) deactivation command is sent until CQI reporting for SCell1 is discontinued.

Table A.8.16.42-1: General test parameters for E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Parameter	Unit	Value	Comment			
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test			
Active PCell		Cell 1	Primary cell on RF channel number 1.			
Deconfigured SCell1		Cell 2	Deconfigured secondary cell on RF channel number 2.			
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.			
CP length		Normal				
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [16]. The same configuration applies to all cells.			
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [16]. The same configuration applies to all cells			
DRX		OFF	Continuous monitoring of primary cell			
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCells every UL subframe			
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.			
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.			
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.			
Filter coefficient		0	L3 filtering is not used			
SCell measurement cycle (measCycleSCell)	ms	320				
T1	ms	100	During this time the PCell and SCell2 shall be known and the SCell1 configured,			
T2	S	1	During this time the UE shall activate the SCell1 and SCell2.			
ТЗ	S	1	During this time the UE shall deactivate the SCell1 and SCell2			
Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.						

Table A.8.16.42-2: Cell specific test parameters for E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3				
		T1	T2	Т3	T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel Number		•	1			2			3	
BW _{channel}		5MHz	z: N _{RB,c} =	= 25	5MHz: N _{RB,c} = 25		5MHz: N _{RB,c} = 25			
			z: N _{RB,c} :			:: N _{RB,c} =		10MHz: $N_{RB,c} = 50$		
			z: N _{RB,c} =		20MHz:	$N_{RB,c} =$	100	20MH	z: N _{RB,c}	= 100
PDSCH parameters:			z: R.4 TI			-			-	
DL Reference Measurement Channel		-	lz: R.0 T lz: R.3 T							
PCFICH/PDCCH/PHICH			z: R.11 T		5MHz	R.11 T	DD	5MH	z: R.11	TDD
parameters:			Iz: R.6 T			z: R.6 T			Hz: R.6	
DL Reference Measurement			z: R.10			:: R.10 T			lz: R.10	
Channel										
OCNG Patterns			z: OP.9 T			OP.10			z: OP.10	
			z: OP.1			: OP.2]			lz: OP.2	
DDOLL DA	-ID	20MH:	z: OP.7	טטו	20MHz	: OP.8 1	טט	20MF	lz: OP.8	3 100
PBCH_RA	dB									
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB		0			0			0	
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA ^{Note 1}	dB									
OCNG_RB ^{Note 1}	dB									
N _{oc} Note 2	dBm/		-104			-104			-104	
Ĉ /NI	15 kHz		47			I	47		47	
Ê _s /N _{oc}	dB		17		-infinit		17		17	
Ê _s /I _{ot} Note 3 RSRP Note 3	dB		17		-infinit		17		17	
RSRP	dBm/ 15 kHz		-87		-infinit	-	87		-87	
SCH_RP Note 3	dBm/		-87		-infinit	_	87		-87	
	15 kHz		-01		-111111111		01		-01	
To Note 3	dBm/	-59	.13+10lc	oq	-76.22	-59.13	3+10log	-59	9.13+10	log
	Ch BW		I _{RB,c} /50)		+10log		_{3,c} /50)		N _{RB,c} /50	
					(N _{RB,c} /50)	-				
Propagation Condition		,	AWGN		Α	WGN			AWGN	
Antenna Configuration			1x2			1x2			1x2	
Timing offset to Cell 1	μs		-			0			0	
Time alignment error relative to cell 1 Note 5	μs		-		_	TAE			≤ TAE	
Time alignment error relative to cell 2 Note 5	μs		-			-			≤ TAE	
Note 1: OCNC shall be used a		ا ممالم معم	fully alla	+			:44			

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

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

Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: The time alignment error (TAE) between two cells specified in TS 36.104 [30] clause 6.5.3.1 (value depends upon the type of carrier aggregation).

A.8.16.42.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell1 in a subframe (m+8)), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated. Whether CSI report in subframe (m+8) and/or (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) and/or (m+9).

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index at latest in a subframe (m+39).

During T3 the UE shall stop sending CSI reports for SCell1 at latest in a subframe (n+8).

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+11) and outside the subframes (m+20) to (m+26).

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+11) and outside the subframes (n+20) to (n+26).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+39) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.43 E-UTRAN TDD-FDD CA activation and deactivation of known SCell in non-DRX with PCell in FDD

A.8.16.43.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7, when the SCell is known by the UE at the time of activation and PCell is in FDD.

The test parameters are given in Tables A.8.16.43.1-1 and cell-specific parameters in A.8.16.43.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (Cell 2) becomes configured on radio channel 2 (SCC). The UE now starts monitoring also the SCC. The test equipment sends a MAC message for activation of the SCell.

The point in time at which the MAC message is received at the UE antenna connector, in a subframe # denoted m which is an even number, defines the start of time period T2. The UE shall be able to report valid CSI for the activated SCell at latest in subframe (m+24). The UE shall start reporting CSI in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCell shall occur in the subframes (m+5) to (m+9).

Time period T3 starts when a MAC message for deactivation of SCell, sent from the test equipment to the UE in a subframe # denoted n which is an even number, received at the UE antenna connector. The UE shall carry out deactivation of the SCell in a subframe (n+8), and any PCell interruption due to the deactivation shall occur in the subframes (n+5) to (n+9).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the subframes from the time when the SCell deactivation command is sent until CQI reporting for SCell is discontinued.

Table A.8.16.43.1-1: General test parameters for known SCell activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel		1, 2	Two radio channels are used for this test
Number		1, 2	
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated		Cell 2	Deconfigured deactivated secondary cell
SCell		Cell 2	on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and		0	CQI reporting for SCell every second
offset configuration index		U	subframe
Cell-individual offset for cells	dB	0	Individual offset for cells on primary
on RF channel number 1	ub	U	component carrier.
Cell-individual offset for cells	dB	0	Individual offset for cells on secondary
on RF channel number 2	uБ	U	component carrier.
SCell measurement cycle	ms	320	
(measCycleSCell)	1113	320	
T1	s	7	During this time the PCell shall be known
	5	I	and the SCell configured and detected.
T2	s	1	During this time the UE shall activate the
	٥	I	SCell.
T3		1	During this time the UE shall deactivate
	S	!	the SCell.

Table A.8.16.43.1-2: Cell specific test parameters for E-UTRAN FDD known SCell activation with PCell in FDD

Parameter	Unit	Cell 1	Cell 2		
		T1 T2 T3	T1 T2 T3		
E-UTRA RF Channel		1	2		
Number		·			
BW _{channel}	MHz	5MHz: $N_{RB,c} = 25$	5MHz: $N_{RB,c} = 25$		
		$10MHz: N_{RB,c} = 50$	$10MHz: N_{RB,c} = 50$		
		$20MHz: N_{RB,c} = 100$	20MHz: $N_{RB,c} = 100$		
PDSCH parameters:		5MHz: R.7 FDD	-		
DL Reference		10MHz: R.3 FDD			
Measurement Channel		20MHz: R.6 FDD			
PCFICH/PDCCH/PHIC		5MHz: R.11 FDD	5MHz: R.11 TDD		
H parameters:		10MHz: R.6 FDD	10MHz: R.6 TDD		
DL Reference		20MHz: R.10 FDD	20MHz: R.10 TDD		
Measurement Channel					
OCNG Patterns		5MHz: OP.20 FDD	5MHz: OP.10 TDD		
		10MHz: OP.10 FDD	10MHz: OP.2 TDD		
		20MHz: OP.17 FDD	20MHz: OP.8 TDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0	0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
N _{oc} Note 2	dBm/15	-104	-104		
	kHz				
Ê _s /N _{oc}	dB	17	17		
Ê _s /I _{ot}	dB	17	17		
RSRP Note 3	dBm/15	-87	-87		
	kHz				
SCH_RP Note 3	dBm/15	-87	-87		
	kHz				
lo Note 3	dBm/Ch	-59.13	-59.13		
	BW	+10log	+10log		
		(N _{RB,c} /50)	(N _{RB,c} /50)		
Propagation Condition		AWGN	AWGN		
Antenna Configuration		1x2	1x2		
Timing offset to Cell 1	μs	-	0		
Time alignment error	μS	-	≤ TAE		
relative to cell 1 Note 5					

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

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

Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.43.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+10) if the suframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+24).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+9).

During T3 interruption of PCell during SCell deactivation shall not happen outside the subframes (n+5) to (n+9).

The interruption of PCell shall not be more than the values specified for inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+24) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.16.44 E-UTRAN TDD-FDD CA activation and deactivation of unknown SCell in non-DRX with PCell in FDD

A.8.16.44.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in section 7.7, when the SCell is unknown by the UE at the time of activation and PCell is in FDD.

The test parameters are given in Tables A.8.16.44.1-1 and cell-specific parameters in A.8.16.44.1-2 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Cell 1 has constant signal level throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (Cell 2) becomes configured on radio channel 2 (SCC). During T1 the SCell is powered off and UE is not aware of SCell.

A MAC message for activation of SCell is sent by the test equipment 100ms after the RRC message, in a subframe # denoted m which is an even number. The point in time at which the MAC message for activation of SCell is received at the UE antenna connector defines the start of time period T2. Immediately at beginning of T2 the transmission power of cell 2 is increased to same level as for cell 1. The UE shall be able to report valid CSI for the activated SCell at latest in subframe (m+34) provided the SCell can be successfully detected on the first attempt. The UE shall start reporting CSI in subframe (m+8) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCell shall occur in the subframes (m+5) to (m+9).

Time period T3 starts when a MAC message for deactivation of the SCell, sent from the test equipment to the UE in a subframe # denoted n which is an even number, is received at the UE antenna connector. The UE shall carry out deactivation of the SCell at latest in subframe (n+8), and any PCell interruption due to the deactivation shall occur in the subframes (n+5) to (n+9).

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell, respectively.

The test equipment verifies the activation time by counting the subframes from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the subframes from the time when the SCell deactivation command is sent until CQI reporting for SCell1 is discontinued.

Table A.8.16.44.1-1: General test parameters for unknown SCell activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel		1, 2	Two radio channels are used for this test
Number		1, 2	
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated		Cell 2	Deconfigured deactivated secondary cell
SCell		Cell 2	on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and		0	CQI reporting for SCell every second
offset configuration index		U	subframe
Cell-individual offset for cells	dB	0	Individual offset for cells on primary
on RF channel number 1	uБ	U	component carrier.
Cell-individual offset for cells	dB	0	Individual offset for cells on secondary
on RF channel number 2	UD	O	component carrier.
SCell measurement cycle	ms	320	
(measCycleSCell)	1113	320	
T1	ms	100	During this time the PCell shall be known
	1113	100	and the SCell configured, but not detected.
T2	s	1	During this time the UE shall activate the
	5	I	SCell.
T3		1	During this time the UE shall deactivate
	S	'	the SCell.

Table A.8.16.44.1-2: Cell specific test parameters for E-UTRAN FDD unknown SCell activation

Parameter	Unit	Cell 1	Cell 2					
		T1 T2 T3	T1 T2 T3					
E-UTRA RF Channel		1	2					
Number		•	_					
BW _{channel}	MHz	5MHz: N _{RB,c} = 25	5MHz: $N_{RB,c} = 25$					
		10MHz: N _{RB,c} = 50	10MHz: N _{RB,c} = 50					
DDCCI I marrametara		20MHz: N _{RB,c} = 100	20MHz: N _{RB,c} = 100					
PDSCH parameters: DL Reference		5MHz: R.7 FDD 10MHz: R.3 FDD	-					
Measurement Channel		20MHz: R.6 FDD						
PCFICH/PDCCH/PHIC		5MHz: R.11 FDD	5MHz: R.11 TDD					
H parameters:		10MHz: R.6 FDD	10MHz: R.6 TDD					
DL Reference		20MHz: R.10 FDD	20MHz: R.10 TDD					
Measurement Channel		2011112.11.10122	2011112.11.10 100					
OCNG Patterns		5MHz: OP.20 FDD	5MHz: OP.10 TDD					
		10MHz: OP.10 FDD	10MHz: OP.2 TDD					
		20MHz: OP.17 FDD	20MHz: OP.8 TDD					
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB	0	0					
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1} Noc Note 2	dB							
N _{oc} ^{Note 2}	dBm/15	-104	-104					
<u>^</u>	kHz							
Ê _s /N _{oc}	dB	17	-Infinity 17					
Ê _s /I _{ot}	dB	17	-Infinity 17					
RSRP Note 3	dBm/15	-87	-Infinity -87					
OOLL DD Note 3	kHz	~=	1.6.7					
SCH_RP Note 3	dBm/15	-87	-Infinity -87					
lo Note 3	kHz dBm/Ch	-59.13	-76.22 -59.13					
10	BW	-59.13 +10log						
	DVV	(N _{RB,c} /50)						
		(1 1 RB,c /30)	(N _{RB,c} (N _{RB,c} /50)					
Propagation Condition		AWGN	AWGN					
Antenna Configuration		1x2	1x2					
Timing offset to Cell 1	μS	-	0					
Time alignment error	μS	-	≤ TAE					
relative to cell 1 Note 5	μο		- :/_					
Note 1: OCNG shall be used such that all cells are fully allocated and a constant								

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

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

Note 3: Es/lot, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.16.44.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell (m+8), or in a subframe (m+10) if the subframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+34).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+9).

During T3 interruption of PCell during SCell deactivation shall not happen outside the subframes (n+5) to (n+9).

The interruption of PCell shall not be more than the values specified for inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation and deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a subframe (m+34) then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

A.8.17 RSTD Measurements for E-UTRAN Carrier Aggregation

A.8.17.1 E-UTRAN FDD RSTD measurement reporting delay test case

A.8.17.1.1 Test Purpose and Environment

The purpose of the test case is to verify that the RSTD measurements meet the requirements specified in Clause 8.4 in a synchronized network environment with fading propagation conditions. This test case will verify the measurement period requirements specified in Clause 8.4.3 for RSTD measurements performed on the secondary component carrier and also the measurement period requirements for RSTD measurements performed on both the primary and secondary component carriers specified in Clause 8.4.4.

In the tests, there are two configured component carriers: PCC and SCC, and three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is PCell on the PCC, Cell 2 is an active SCell on the SCC, and Cell 3 is a neighbour cell on the SCC. In all tests, Cell 2 is the OTDOA assistance data reference cell.

The test case includes two tests. Test 1 is designed for the scenario where the UE receives OTDOA assistance data with cells on SCC, and the UE is expected to report RSTD measurements performed on SCC only. Test 2 is designed for the scenario where the UE receives OTDOA assistance data with cells on PCC and SCC, and the UE is expected to report RSTD measurements performed on PCC and on SCC.

Each test consists of three consecutive time intervals, with duration of T1, T2 and T3. Cell 1 is active in T1, T2 and T3, whilst Cell 2 is active only in T2 and T3, and Cell 3 is active only during T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the OTDOA assistance data reference cell, where the PRS positioning occasion is as defined in Clause 8.1.2.5.1. Cell 1 transmits PRS in T2, while Cell 2 transmits PRS only in T3, and Cell 3 transmits PRS only in T2.

Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

The test parameters are as given in Table A.8.17.1.1-1, Table A.8.17.1.1-2, Table A.8.17.1.1-3 and Table A.8.17.1.1-4.

Table A.8.17.1.1-1: General test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	V Test 1	alue Test 2	Comment
PCell			cell 1	PCell is on RF channel 1 (PCC).
SCell		С	ell 2	SCell on RF channel 2 (SCC). Cell 2 is the assistance data reference cell.
Other neighbor cell		С	cell 3	Neighbor cell on RF channel 2 (SCC).
PCFICH/PDCCH/PHICH parameters			easurement Channel 3 FDD	As specified in clause A.3.1.2.1
Channel Bandwidth (BW _{channel})	MHz		10	
PRS Transmission Bandwidth	RB		50	PRS are transmitted over the system bandwidth
PRS configuration index $I_{\rm PRS}$			cells on PCC cells on SCC	This corresponds to periodicity of 320 ms and PRS subframe offset of $I_{\rm PRS}-160$ DL subframes, as defined in TS
Number of consecutive downlink positioning subframes N_{PRS}			1	36.211 [16], Table 6.10.4.3-1 As defined in TS 36.211 [16]. The number of subframes in a positioning occasion
Physical cell ID PCI		(PCI of Cell 2 – PCI of Cell 3)mod6=0		The PCI of Cell 1 is selected randomly. PCIs of Cell 2 and Cell 3 are selected randomly such that the relative subcarrier shifts of PRS patterns among these cells are as given by the condition
CP length		No	ormal	
DRX		1	ON	DRX parameters are further specified in Table A.8.17.1.1-3
Radio frame receive time offset between the cells at the UE antenna connector	μs		o Cell 2: 1 o Cell 2: -1	PRS are transmitted from synchronous cells
Time alignment error between cell2 and cell1	μs		error as specified in [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Expected RSTD	μs	Cell 3: 2 Other neighbour cells: randomly between -3 and 3	Cell 1: -2 Cell 3: 2 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
Expected RSTD uncertainty for all neighbour cells	μs	5		The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
Cells in OTDOA assistance data		OTDOA neighbor cells include Cell 3 and other 14 cells on SCC	OTDOA neighbor cells include Cell 1 and other 7 cells on PCC, and Cell 3 and other 6 cells on SCC	The list includes the reference cell (received in OTDOA-ReferenceCellInfo [24]) and 15 other cells, all received in OTDOA-ProvideAssistanceData [24]. Cell 1 (when included) appears at random places in the first half of the neighbour cell list in the OTDOA assistance data. Cell 3 always appears at random places in the second half of the list.

prs-SubframeOffset			on PCC: 310 xcept reference cell: 0	Subframe offset, counted in full subframes. The corresponding parameter in the OTDOA assistance data is prs-SubframeOffset specified in TS 36.355 [24]
slotNumberOffset			on PCC: 0 xcept reference cell: 0	The slot number offset at the transmitter between a neighbour cell and the assistance data reference cell. The corresponding parameter in the OTDOA assistance data is slotNumberOffset specified in TS 36.355 [24].
PRS muting info		Cell 1: Cell 1: '11110000' '1111111100000000' Cell 2: Cell 2: '00001111' '0000000011111111' Cell 3: Cell 3: '11110000' '1111111100000000'		Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	s	3		The length of the time interval from the beginning of each test
T2	S	1.28 2.48		The length of the time interval that follows immediately after time interval T1
Т3	s	1.28	2.48	The length of the time interval that follows immediately after time interval T2

Table A.8.17.1.1-2: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

Parameter	Unit	Cell 1	Cell 2	Cell 3			
E-UTRA RF Channel Number		1	N/A	N/A			
Correlation Matrix and Antenna Configuration		1x2 Low	1x2 Low	1x2 Low			
OCNG patterns defined in A.3.2.1		OP.5 FDD	N/A	N/A			
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA OCNG_RB OCNG_RB	dB	0	N/A	N/A			
N_{oc} Note 3	dBm/ 15 kHz	-95	N/A	N/A			
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$	dB	-Infinity	-Infinity	-Infinity			
lo Note 4	dBm/ 9 MHz	-67.22	N/A	N/A			
$\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$	dB	0	-Infinity	-Infinity			
Propagation Condition	ll be used to	ETU30					

Note 1: OCNG shall be used such that active cell (Cell 1) is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time

Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: lo levels have been derived from other parameters and are given for information purpose. These are not settable test parameters.

Table A.8.17.1.1-3: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2	Т3	T2	Т3	T2	T3
E-UTRA RF			1	2			2
Channel Number							
Correlation Matrix		1x2	2 Low	1x2	Low	1x2	Low
and Antenna							
Configuration						00.0	1
OCNG patterns		OP.	5 FDD	OP.6	FDD	OP.6	N/A
defined in A.3.2.1						FDD	
PBCH_RA	}						
PBCH_RB							
PSS_RA	-						
SSS_RA	<u> </u>						
PCFICH_RB							
PHICH_RA	dB		0	C)	0	N/A
PHICH_RB	<u> </u>						
PDCCH_RA	<u> </u>						
PDCCH_RB							
OCNG_RA ^{Note 1}							
OCNG_RB ^{Note 1}					1		
PRS_RA	dB	-6	N/A	N/A	3	3	N/A
$N_{oc}^{ m Note~3}$	dBm/ 15 kHz	-98	-98	-98	-95	-98	-95
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-4	-Infinity	-Infinity	-1	-8	-Infinity
PRS $\hat{E}_{_{s}}/I_{_{ot}}^{}$ Note 4	dB	-4	-Infinity	-Infinity	-1	-8	-Infinity
lo Note 4	dBm/ 9 MHz	-69.94	N/A	N/A	-66.68	-70.11	N/A
PRP Note 4	dBm/ 15 kHz	-102	-Infinity	-Infinity	-96	-106	-Infinity
RSRP Note 4	dBm/ 15 kHz	-96	-96	-105	-99	-109	-Infinity
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 4}}$	dB	2	2	-7	-4	-11	-Infinity
Propagation Condition			ETU30				

Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: If PRS_RA is not "N/A", \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters and are given for information purpose. If PRS_RA is "N/A", Io and RSRP levels have been derived from other parameters and are given for information purpose. These are not settable test parameters. Interference conditions shall be applied to all PRS symbols of DL positioning subframes.

Table A.8.17.1.1-4: DRX parameters for the test of E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Field	Value	Comment
onDurationTimer	psf1	
Drx-InactivityTimer	psf1	As appointed in
drx-RetransmissionTimer	sf1	- As specified in - TS 36.331 [2], Clause 6.3.2
longDRX-CycleStartOffset	sf320	13 30.331 [2], Clause 6.3.2
shortDRX	Disable	

A.8.17.1.2 Test Requirements

The RSTD measurement time fulfils the requirements specified in Clause 8.4.

In Test 1, the UE shall perform and report the RSTD measurements from Cell 2 and Cell 3 within 2560 ms starting from the beginning of time interval T2.

In Test 2, the UE shall perform and report the RSTD measurements from Cell 1 and Cell 2, and RSTD measurements from Cell 2 and Cell 3 within 4960 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Clause 9.1.10.3, i.e., between RSTD 0000 and RSTD 12711.

NOTE: The RSTD measurement times in the tests are derived from the following expression,

$$T_{PRS}(M-1)+160\left\lceil\frac{n}{M}\right\rceil,$$

where M =8 and n =16 for Test 1, and M =16 and n =16 for Test 2. For Test 1, the M and n parameters specified in Clause 8.1.2.5.1, Table 8.1.2.5.1-1, under Note 1, which gives the total RSTD measurement time of 2560 ms for Cell 3 with respect to the reference cell Cell 2. For Test 2, the M and n parameters are specified in Clause 8.1.2.6.1, Table 8.1.2.6.1-1, under Note 1, which gives the total RSTD measurement time of 4960 ms for reporting the RSTD measurements of Cell 1 and Cell 3 with respect to the reference cell Cell 2.

A.8.17.2 E-UTRAN TDD RSTD measurement reporting delay test case

A.8.17.2.1 Test Purpose and Environment

The purpose of the test case is to verify that the RSTD measurements meet the requirements specified in Clause 8.4 in a synchronized network environment with fading propagation conditions. This test case will verify the measurement period requirements specified in Clause 8.4.3 for RSTD measurements performed on the secondary component carrier and also the measurement period requirements for RSTD measurements performed on both the primary and secondary component carriers specified in Clause 8.4.4.

In the tests, there are two configured component carriers: PCC and SCC, and three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is PCell on the PCC, Cell 2 is an active SCell on the SCC, and Cell 3 is a neighbour cell on the SCC. In all tests, Cell 2 is the OTDOA assistance data reference cell.

The test case includes two tests. Test 1 is designed for the scenario where the UE receives OTDOA assistance data with cells on SCC, and the UE is expected to report RSTD measurements performed on SCC only. Test 2 is designed for the scenario where the UE receives OTDOA assistance data with cells on PCC and SCC, and the UE is expected to report RSTD measurements performed on PCC and on SCC.

Each test consists of three consecutive time intervals, with duration of T1, T2 and T3. Cell 1 is active in T1, T2 and T3, whilst Cell 2 is active only in T2 and T3, and Cell 3 is active only during T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the OTDOA assistance data reference cell, where the PRS positioning occasion is as defined in Clause 8.1.2.5.1. Cell 1 transmits PRS in T2, while Cell 2 transmits PRS only in T3, and Cell 3 transmits PRS only in T2.

Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

The test parameters are as given in Table A.8.17.2.1-1, Table A.8.17.2.1-2, Table A.8.17.2.1-3 and Table A.8.17.2.1-4.

Table A.8.17.2.1-1: General test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PCell		Ce	<u>ll 1 </u>	PCell is on RF channel 1 (PCC).
SCell		Ce	II 2	SCell on RF channel 2 (SCC). Cell 2 is the assistance data reference cell.
Other neighbor cell		Ce	II 3	Neighbor cell on RF channel 2 (SCC).
PCFICH/PDCCH/PHICH parameters			urement Channel R.6 DD	As specified in clause A.3.1.2.2
Channel Bandwidth (BW _{channel})	MHz	1	0	
PRS Transmission Bandwidth	RB	5	0	PRS are transmitted over the system bandwidth
PRS configuration index I_{PRS}			ells on PCC ells on SCC	This corresponds to periodicity of 320 ms and PRS subframe offset of $I_{\rm PRS}$ – 160 DL subframes, as defined in TS 36.211 [16], Table 6.10.4.3-1
Number of consecutive downlink positioning subframes N_{PRS}			ı	As defined in TS 36.211 [16]. The number of subframes in a positioning occasion
Physical cell ID PCI		(PCI of Cell 2 – PCI of Cell 3)mod6=0		The PCI of Cell 1 is selected randomly. PCIs of Cell 2 and Cell 3 are selected randomly such that the relative subcarrier shifts of PRS patterns among these cells are as given by the condition
TDD uplink-downlink configuration		1		As specified in TS 36.211 [16], Clause 4.2; corresponds to a configuration with 5 ms switch- point periodicity and two downlink consecutive subframes
TDD special subframe configuration		(6	As specified in TS 36.211 [16], Clause 4.2; corresponds to DwPTS of $19760 \cdot T_{\rm s}$ and
CD longth		Nor	mal	UpPTS of $4384 \cdot T_{\mathrm{s}}$
CP length				DRX parameters are further
DRX		0	N	specified in Table A.8.17.2.1-3
Radio frame receive time offset between the cells at the UE antenna connector	μs	Cell 1 to Cell 3 to		PRS are transmitted from synchronous cells
Time alignment error between cell2 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.		The value of time alignment error depends upon the type of carrier aggregation.
Expected RSTD	μs	Cell 3: 2 Other neighbour cells: randomly between -3 and 3 Cell 1: -2 Cell 3: 2 Other neighbour cells: randomly between -3 and 3		The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
Expected RSTD uncertainty for all neighbour cells	μs	5		The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
Cells in OTDOA		16 cells	in total	The list includes the reference

assistance data		OTDOA neighbor cells include Cell 3 and other 14 cells on SCC	OTDOA neighbor cells include Cell 1 and other 7 cells on PCC, and Cell 3 and other 6 cells on SCC	cell (received in OTDOA-ReferenceCellInfo [24]) and 15 other cells, all received in OTDOA-ProvideAssistanceData [24]. Cell 1 (when included) appears at random places in the first half of the neighbour cell list in the OTDOA assistance data. Cell 3 always appears at random places in the second half of the list.
prs-SubframeOffset			on PCC: 310 except reference cell: 0	Subframe offset, counted in full subframes. The corresponding parameter in the OTDOA assistance data is prs- SubframeOffset specified in TS 36.355 [24]
slotNumberOffset			on PCC: 0 except reference cell: 0	The slot number offset at the transmitter between a neighbour cell and the assistance data reference cell. The corresponding parameter in the OTDOA assistance data is slotNumberOffset specified in TS 36.355 [24].
PRS muting info		Cell 1: '11110000' Cell 2: '00001111' Cell 3: '11110000'	Cell 1: '1111111100000000' Cell 2: '0000000011111111' Cell 3: '11111111100000000'	Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	s		3	The length of the time interval from the beginning of each test
T2	s	1.28	2.48	The length of the time interval that follows immediately after time interval T1
Т3	s	1.28	2.48	The length of the time interval that follows immediately after time interval T2

Table A.8.17.2.1-2: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

Parameter	Unit	Cell 1	Cell 2	Cell 3			
E-UTRA RF Channel Number		1	N/A	N/A			
Correlation Matrix		1x2 Low	1x2 Low	1x2 Low			
and Antenna							
Configuration							
OCNG patterns		OP.1 TDD	N/A	N/A			
defined in A.3.2.2							
PBCH_RA	<u> </u>						
PBCH_RB	1						
PSS_RA	<u> </u>						
SSS_RA	<u> </u>						
PCFICH_RB	<u> </u>						
PHICH_RA	dB	0	N/A	N/A			
PHICH_RB							
PDCCH_RA							
PDCCH_RB	Ī						
OCNG_RA ^{Note 1}	Ī						
OCNG_RB ^{Note 1}							
$N_{oc}^{ m Note~3}$	dBm/ 15 kHz	-95	N/A	N/A			
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-Infinity	-Infinity	-Infinity			
Io Note 4	dBm/ 9 MHz	-67.22	N/A	N/A			
$\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$	dB	0	-Infinity	-Infinity			
Propagation Condition		ETU30					
Note 1: OCNG sha	OCNG shall be used such that active cell (Cell 1) is fully allocated and a constant total						

Note 1: OCNG shall be used such that active cell (Cell 1) is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time

Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: Io levels have been derived from other parameters and are given for information purpose. These are not settable test parameters.

Table A.8.17.2.1-3: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2	Т3	T2	Т3	T2	T3
E-UTRA RF			1	2			2
Channel Number							
Correlation Matrix		1x2	2 Low	1x2	Low	1x2	Low
and Antenna							
Configuration						00.0	1
OCNG patterns		OP.	1 TDD	OP.2	TDD	OP.2	N/A
defined in A.3.2.2						TDD	
PBCH_RA	}						
PBCH_RB	1						
PSS_RA	-						
SSS_RA	<u> </u>						
PCFICH_RB							
PHICH_RA	dB		0	0		0	N/A
PHICH_RB	<u> </u>						
PDCCH_RA	<u> </u>						
PDCCH_RB							
OCNG_RA ^{Note 1}	<u> </u>						
OCNG_RB ^{Note 1}					1		
PRS_RA	dB	-6	N/A	N/A	3	3	N/A
$N_{oc}^{ m Note 3}$	dBm/ 15 kHz	-98	-98	-98	-95	-98	-95
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-4	-Infinity	-Infinity	-1	-8	-Infinity
PRS $\hat{E}_{_{s}}/I_{_{ot}}^{}$ Note 4	dB	-4	-Infinity	-Infinity	-1	-8	-Infinity
lo Note 4	dBm/ 9 MHz	-69.94	N/A	N/A	-66.68	-70.11	N/A
PRP Note 4	dBm/ 15 kHz	-102	-Infinity	-Infinity	-96	-106	-Infinity
RSRP	dBm/ 15 kHz	-96	-96	-105	-99	-109	-Infinity
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 4}}$	dB	2	2	-7	-4	-11	-Infinity
Propagation Condition			ETU30				

Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: If PRS_RA is not "N/A", \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters and are given for information purpose. If PRS_RA is "N/A", Io and RSRP levels have been derived from other parameters and are given for information purpose. These are not settable test parameters. Interference conditions shall be applied to all PRS symbols of DL positioning subframes.

Table A.8.17.2.1-4: DRX parameters for the test of E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Field	Value	Comment
onDurationTimer	psf1	
Drx-InactivityTimer	psf1	As appointed in
drx-RetransmissionTimer	sf1	As specified in
longDRX-CycleStartOffset	sf320	TS 36.331 [2], Clause 6.3.2
shortDRX	Disable	

A.8.17.2.2 Test Requirements

The RSTD measurement time fulfils the requirements specified in Clause 8.4.

In Test 1, the UE shall perform and report the RSTD measurements from Cell 2 and Cell 3 within 2560 ms starting from the beginning of time interval T2.

In Test 2, the UE shall perform and report the RSTD measurements from Cell 1 and Cell 2, and RSTD measurements from Cell 2 and Cell 3 within 4960 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Clause 9.1.10.3, i.e., between RSTD 0000 and RSTD 12711.

NOTE: The RSTD measurement times in the tests are derived from the following expression,

$$T_{PRS}(M-1)+160\left\lceil\frac{n}{M}\right\rceil$$

where M =8 and n =16 for Test 1, and M =16 and n =16 for Test 2. For Test 1, the M and n parameters specified in Clause 8.1.2.5.1, Table 8.1.2.5.1-1, under Note 1, which gives the total RSTD measurement time of 2560 ms for Cell 3 with respect to the reference cell Cell 2. For Test 2, the M and n parameters are specified in Clause 8.1.2.6.1, Table 8.1.2.6.1-1, under Note 1, which gives the total RSTD measurement time of 4960 ms for reporting the RSTD measurements of Cell 1 and Cell 3 with respect to the reference cell Cell 2.

A.8.17.3 E-UTRAN FDD RSTD Measurement Reporting Test Case for 20 MHz

A.8.17.3.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.8.17.1.1.

The parameters of this test are the same as defined in Subclause A.8.17.1.1 except that the values of the parameters in Table A.8.17.3.1-1, Table A.8.17.3.1-2 and Table A.8.17.3.1-1 will replace the values of the corresponding parameters in Table A.8.17.1.1-1, Table A.8.17.1.1-2 and Table A.8.17.1.1-3, respectively.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.3.1-1: General test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	Value		Comment
		Test 1 Test 2		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 FDD		As specified in section A.3.1.2.1
Channel Bandwidth (BW _{channel})	MHz	20		
PRS Transmission Bandwidth	RB		100	PRS are transmitted over the system bandwidth

Note 1: See Table A.8.17.1.1-1 for the other parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.3.1-2: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

OCNG patterns defined in A.3.2.1 OP.13 FDD N/A N/A Io Note 1 dBm/ -64.21 N/A N/A	Parameter	Cell 1	Cell 2	Cell 3
$1.10^{1.000}$		OP.13 FDI	N/A	N/A
18 MHz 54.21 14/1	lo Note 1	-64 21	N/A	N/A

Note 1: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-2 for the other parameters.

Table A.8.17.3.1-3: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2	T3	T2	T3	T2	Т3
OCNG patterns defined in A.3.2.1		OP.1	3 FDD	OP.14	FDD	OP.14 FDD	N/A
Io Note 1	dBm/ 18 MHz	-66.93	N/A	N/A	-63.67	-67.09	N/A

Note 1: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-3 for the other parameters.

A.8.17.3.2 Test Requirements

The test requirements defined in section A.8.17.1.2 shall apply in this test case.

A.8.17.4 E-UTRAN TDD RSTD Measurement Reporting Test Case for 20 MHz

A.8.17.4.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.8.17.2.1.

The parameters of this test are the same as defined in Subclause A.8.17.2.1 except that the values of the parameters in Table A.8.17.4.1-1, Table A.8.17.4.1-2 and Table A.8.17.4.1-1 will replace the values of the corresponding parameters in Table A.8.17.2.1-1, Table A.8.17.2.1-2 and Table A.8.17.2.1-3, respectively.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.4.1-1: General test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	Value		Comment
		Test 1 Test 2		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD		As specified in section A.3.1.2.2
Channel Bandwidth (BW _{channel})	MHz	20		
PRS Transmission Bandwidth	RB		100	PRS are transmitted over the system bandwidth

Note 1: See Table A.8.17.2.1-1 for the other parameters.

This test verifies the RRM requirement which is independent of channel bandwidth and is performed Note 2: according to the principle defined in section A.3.6.1.

Table A.8.17.4.1-2: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

OCNG patterns defined in A.3.2.2 OP.7 TDD N/A N/A Io Note 1 dBm/ 18 MHz -64.21 N/A N/A	Parameter	Unit	Cell 1	Cell 2	Cell 3
1 10 · · · · · · · · · · · · · · · · · ·			OP.7 TDD	N/A	N/A
10 10112	lo Note 1	dBm/ 18 MHz	-64.21	N/A	N/A

Io levels have been derived from other parameters for information purposes. They are

not settable parameters themselves.

Note 2: See Table A.8.17.2.1-2 for the other parameters.

Table A.8.17.4.1-3: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2	T3	T2	T3	T2	Т3
OCNG patterns defined in A.3.2.2		OP.	7 TDD	OP.8	TDD	OP.8 TDD	N/A
Io Note 1	dBm/ 18 MHz	-66.93	N/A	N/A	-63.67	-67.09	N/A

lo levels have been derived from other parameters for information purposes. They are Note 1: not settable parameters themselves.

See Table A.8.17.2.1-3 for the other parameters. Note 2:

A.8.17.4.2 **Test Requirements**

The test requirements defined in section A.8.17.2.2 shall apply in this test case.

A.8.17.5 E-UTRAN FDD RSTD Measurement Reporting Test Case for 10MHz+5MHz

A.8.17.5.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.8.17.1.1.

The parameters of this test are the same as defined in Subclause A.8.17.1.1 except that the values of the parameters in Table A.8.17.5.1-1, Table A.8.17.5.1-2 and Table A.8.17.5.1-1 will replace the values of the corresponding parameters in Table A.8.17.1.1-1, Table A.8.17.1.1-2 and Table A.8.17.1.1-3, respectively.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.5.1-1: General test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	Va	Comment	
		Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters		Cell 1: R.6 FDD Cell 2: R.11 FDD Cell 3: R.11 FDD	Cell 1: R.6 FDD Cell 2: R.11 FDD Cell 3: R.11 FDD	As specified in section A.3.1.2.1
Channel Bandwidth (BW _{channel})	MHz	Cell 1: 10 Cell 2: 5 Cell 3: 5	Cell 1: 10 Cell 2: 5 Cell 3: 5	
PRS Transmission Bandwidth	RB	Cell 1: 50 Cell 2: 25 Cell 3: 25	Cell 1: 50 Cell 2: 25 Cell 3: 25	PRS are transmitted over the system bandwidth

Note 1: See Table A.8.17.1.1-1 for the other parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.5.1-2: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

Parameter	Unit	Cell 1 Cell 2		Cell 3			
	dBm/	-67.22	N/A	N/A			
lo Note 1	9 MHz	-07.22	IN/A	IN/A			
10	dBm/	N/A	N/A	N/A			
	4.5MHz	IN/A	IN/A	IN/A			
Note 1: lo levels have been derived from other parameters for information purposes.							

They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-2 for the other parameters.

Table A.8.17.5.1-3: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2	T3	T2	T3	T2	T3
OCNG patterns defined in A.3.2.1		OP.	5 FDD	OP.19	FDD	OP.19 FDD	N/A
lo Note 1	dBm/ 9 MHz	-69.94	N/A	N/A	N/A	N/A	N/A
10	dBm/ 4.5MHz	N/A	N/A	N/A	-69.69	-73.12	N/A

Note 1: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-3 for the other parameters.

A.8.17.5.2 Test Requirements

The test requirements defined in section A.8.17.1.2 shall apply in this test case.

A.8.17.6 E-UTRAN TDD RSTD Measurement Reporting Test Case for 10MHz+5MHz

A.8.17.6.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.8.17.2.1.

The parameters of this test are the same as defined in Subclause A.8.17.2.1 except that the values of the parameters in Table A.8.17.6.1-1, Table A.8.17.6.1-2 and Table A.8.17.6.1-1 will replace the values of the corresponding parameters in Table A.8.17.2.1-1, Table A.8.17.2.1-2 and Table A.8.17.2.1-3, respectively.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.6.1-1: General test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	Va	lue	Comment
		Test 1	Test 2]
PCFICH/PDCCH/PHICH parameters		Cell 1: R.6 TDD Cell 2: R.11 TDD Cell 3: R.11 TDD	Cell 1: R.6 TDD Cell 2: R.11 TDD Cell 3: R.11 TDD	As specified in section A.3.1.2.2
Channel Bandwidth (BW _{channel})	MHz	Cell 1: 10 Cell 2: 5 Cell 3: 5	Cell 1: 10 Cell 2: 5 Cell 3: 5	
PRS Transmission Bandwidth	RB	Cell 1: 50 Cell 2: 25 Cell 3: 25	Cell 1: 50 Cell 2: 25 Cell 3: 25	PRS are transmitted over the system bandwidth

Note 1: See Table A.8.17.2.1-1 for the other parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.6.1-2: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

Parameter	Unit	Cell 1	Cell 2	Cell 3
lo Note 1	dBm/ 9 MHz	-67.22	N/A	N/A
10	dBm/ 4.5MHz	N/A	N/A	N/A

Note 1: lo levels have been derived from other parameters for information purposes.

They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-2 for the other parameters.

Table A.8.17.6.1-3: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2	T3	T2	T3	T2	Т3
OCNG patterns defined in A.3.2.1		OP.	1 TDD	OP.10	TDD	OP.10 TDD	N/A
lo Note 1	dBm/ 9 MHz	-69.94	N/A	N/A	N/A	N/A	N/A
10	dBm/ 4.5MHz	N/A	N/A	N/A	-69.69	-73.12	N/A

Note 1: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-3 for the other parameters.

A.8.17.6.2 Test Requirements

The test requirements defined in section A.8.17.2.2 shall apply in this test case.

A.8.17.7 E-UTRAN FDD RSTD Measurement Reporting Test Case for 5 + 5 MHz Bandwidth

A.8.17.7.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.8.17.1.1.

The parameters of this test are the same as defined in Subclause A.8.17.1.1 except that the values of the parameters in Table A.8.17.7.1-1, Table A.8.17.7.1-2 and Table A.8.17.7.1-1 will replace the values of the corresponding parameters in Table A.8.17.1.1-1, Table A.8.17.1.1-2 and Table A.8.17.1.1-3, respectively.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.7.1-1: General test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	Value		Comment
		Test 1 Test 2		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD		As specified in section A.3.1.2.1
Channel Bandwidth (BW _{channel})	MHz	5		
PRS Transmission Bandwidth	RB	25		PRS are transmitted over the system bandwidth

Note 1: See Table A.8.17.1.1-1 for the other parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.7.1-2: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

Parameter	Unit	Cell 1	Cell 2	Cell 3
OCNG patterns defined in A.3.2.1		OP.18 FDD	N/A	N/A
lo ^{Note 1}	dBm/ 4.5 MHz	-70.23	N/A	N/A

Note 1: lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-2 for the other parameters.

Table A.8.17.7.1-3: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2 T3		T2	T3	T2	T3
OCNG patterns defined in A.3.2.1		OP.18 FDD		OP.19 FDD		OP.19 FDD	N/A
Io Note 1	dBm/ 4.5 MHz	-72.95	N/A	N/A	-69.69	-73.12	N/A

Note 1: lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-3 for the other parameters.

A.8.17.7.2 Test Requirements

The test requirements defined in section A.8.17.1.2 shall apply in this test case.

A.8.17.8 E-UTRAN TDD RSTD Measurement Reporting Test Case for 5+5 MHz bandwidth

A.8.17.8.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.8.17.2.1.

The parameters of this test are the same as defined in Subclause A.8.17.2.1 except that the values of the parameters in Table A.8.17.8.1-1, Table A.8.17.8.1-2 and Table A.8.17.8.1-1 will replace the values of the corresponding parameters in Table A.8.17.2.1-1, Table A.8.17.2.1-2 and Table A.8.17.2.1-3, respectively.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.8.1-1: General test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 TDD		As specified in section A.3.1.2.1
Channel Bandwidth (BW _{channel})	MHz	5		
PRS Transmission Bandwidth	RB	25		PRS are transmitted over the system bandwidth

Note 1: See Table A.8.17.2.1-1 for the other parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.8.1-2: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

Parameter	Unit	Cell 1	Cell 2	Cell 3
OCNG patterns defined in A.3.2.1		OP.9 TDD	N/A	N/A
Io Note 1	dBm/ 4.5 MHz	-70.23	N/A	N/A

Note 1: lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: See Table A.8.17.2.1-2 for the other parameters.

Table A.8.17.8.1-3: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2 T3		T2	Т3	T2	Т3
OCNG patterns defined in A.3.2.1		OP.9 TDD		OP.10 TDD		OP.10 TDD	N/A
Io Note 1	dBm/ 4.5 MHz	-72.95	N/A	N/A	-69.69	-73.12	N/A

Note 1: lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: See Table A.8.17.2.1-3 for the other parameters.

A.8.17.8.2 Test Requirements

The test requirements defined in section A.8.17.2.2 shall apply in this test case.

A.8.17.9 E-UTRAN TDD RSTD Measurement Reporting Test Case for 20MHz+10MHz

A.8.17.9.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.8.17.2.1.

The parameters of this test are the same as defined in Subclause A.8.17.2.1 except that the values of the parameters in Table A.8.17.9.1-1, Table A.8.17.9.1-2 and Table A.8.17.9.1-1 will replace the values of the corresponding parameters in Table A.8.17.2.1-1, Table A.8.17.2.1-2 and Table A.8.17.2.1-3, respectively.

Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.9.1-1: General test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	Va	lue	Comment
		Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters		Cell 1: R.10 TDD Cell 2: R.6 TDD Cell 3: R.6 TDD	Cell 1: R.10 TDD Cell 2: R.6 TDD Cell 3: R.6 TDD	As specified in section A.3.1.2.2
Channel Bandwidth (BW _{channel})	MHz	Cell 1: 20 Cell 2: 10 Cell 3: 10	Cell 1: 20 Cell 2: 10 Cell 3: 10	
PRS Transmission Bandwidth	RB	Cell 1: 100 Cell 2: 50 Cell 3: 50	Cell 1: 100 Cell 2: 50 Cell 3: 50	PRS are transmitted over the system bandwidth

Note 1: See Table A.8.17.2.1-1 for the other parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.17.9.1-2: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

Parameter	Unit	Cell 1	Cell 2	Cell 3	
Io Note 1	dBm/ 18 MHz	-64.21	N/A	N/A	
	dBm/ 9 MHz	N/A	N/A	N/A	

Note 1: lo levels have been derived from other parameters for information purposes.

They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-2 for the other parameters.

Table A.8.17.9.1-3: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2	T3	T2	T3	T2	T3
OCNG patterns defined in A.3.2.1		OP.7 TDD		OP.2 TDD		OP.2 TDD	N/A
lo Note 1	dBm/ 18 MHz	-66.93	N/A	N/A	N/A	N/A	N/A
10	dBm/ 9MHz	N/A	N/A	N/A	-66.68	-70.11	N/A

Note 1: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: See Table A.8.17.1.1-3 for the other parameters.

A.8.17.9.2 Test Requirements

The test requirements defined in section A.8.17.2.2 shall apply in this test case.

A.8.17.10 E-UTRAN 3 DL FDD CA RSTD Measurement Reporting Delay Test Case

A.8.17.10.1 Test Purpose and Environment

The purpose of the test case is to verify that the RSTD measurements meet the requirements specified in Clause 8.4 in a synchronized network environment with fading propagation conditions. This test case will verify the measurement period requirements specified in Clause 8.4.3 for RSTD measurements performed on the same secondary component carrier, the measurement period requirements for RSTD measurements performed on both the primary and secondary component carriers specified in Clause 8.4.4, and also the measurement period requirements for RSTD measurements performed on different secondary component carriers specified in Clause 8.4.5.

In the tests, there are three configured component carriers: PCC, SCC1 and SCC2, and four synchronous cells: Cell 1, Cell 2, Cell 3 and Cell 4. Cell 1 is PCell on the PCC, Cell 2 is SCell on the SCC1, Cell 3 is SCell on the SCC2 and Cell 4 is a neighbour cell on the SCC2. In all tests, Cell 3 is the OTDOA assistance data reference cell.

The test case includes two tests. Test 1 is designed for the scenario where the UE receives OTDOA assistance data with cells only on SCC2, and the UE is expected to report RSTD measurements performed on SCC2 only. Test 2 is designed for the scenario where the UE receives OTDOA assistance data with cells on PCC, SCC1 and SCC2, and the UE is expected to report RSTD measurements performed on PCC, SCC1 and SCC2.

Each test consists of three consecutive time intervals, with duration of T1, T2 and T3. Cell 1 is active in T1, T2 and T3, Cell 2 is active only in T2 and T3, Cell 3 is active only during T2 and T3, and Cell 4 is active only during T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the OTDOA assistance data reference cell, where the PRS positioning occasion is as defined in Clause 8.1.2.5.1. Cell 1 transmits PRS in T2, Cell 2 transmits PRS only in T3, and Cell 3 transmits PRS only in T3, and Cell 4 transmits PRS only in T2.

Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

The test parameters are as given in Table A.8.17.10.1-1, Table A.8.17.10.1-2, Table A.8.17.10.1-3 and Table A.8.17.10.1-4.

Table A.8.17.10.1-1: General test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit		'alue	Comment		
		Test 1	Test 2	PCell is on RF channel 1		
PCell		С	Cell 1	(PCC).		
SCell 1		С	Cell 2	SCell 1 on RF channel 2 (SCC1).		
SCell 2		С	Cell 3	SCell 2 on RF channel 3 (SCC2). Cell 3 is the assistance data reference cell.		
Other neighbor cell		С	Cell 4	Neighbor cell on RF channel 3 (SCC2).		
PCFICH/PDCCH/PHICH parameters			easurement Channel 6 FDD	As specified in clause A.3.1.2.1		
PRS configuration index I_{PRS}		181 for all	cells on PCC cells on SCC1 cells on SCC2	This corresponds to periodicity of 320 ms and PRS subframe offset of $I_{\rm PRS}$ -160 DL subframes, as defined in TS 36.211 [16], Table 6.10.4.3-1		
Physical cell ID PCI		(PCI of Cell 3 – P	PCI of Cell 4)mod6=0	The PCIs of Cell 1 and Cell 2 are selected randomly. PCIs of Cell 3 and Cell 4 are selected randomly such that the relative subcarrier shifts of PRS patterns among these cells are as given by the condition		
CP length		No	ormal			
DRX			ON	DRX parameters are further specified in Table A.8.17.10.1-3		
Radio frame receive time offset between the cells at the UE antenna connector	μs	Cell 3 to	to Cell 2: 1 o Cell 2: -1 to Cell 2: 3	PRS are transmitted from synchronous cells		
Time alignment errors between cell1, cell2 and cell3	μs		t error as specified in [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.		
Expected RSTD	μs	Cell 4: 2 Other neighbour cells: randomly between -3 and 3	Cell 1: -2 Cell 2: 0 Cell 4: 2 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator		
Expected RSTD uncertainty for all neighbour cells	μs		5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index		
Cells in OTDOA assistance data		OTDOA neighbor cells	OTDOA neighbor cells include Cell 1 and other 3 cells on PCC, Cell 2 and other 3 cells on SCC1 and Cell 4 and other 6 cells on SCC2	The list includes the reference cell (received in OTDOA-ReferenceCellInfo [24]) and 15 other cells, all received in OTDOA-ProvideAssistanceData [24]. Cell 1 and Cell 2 (when included) appears at random places in the first half of the neighbour cell list in the OTDOA assistance data. Cell 4 always appears at random places in the second half of the list.		

'prs-SubframeOffset		Cells o	on PCC: 310 n SCC1: 320 except reference cell: 0	Subframe offset, counted in full subframes. The corresponding parameter in the OTDOA assistance data is prs-SubframeOffset specified in TS 36.355 [24]
slotNumberOffset		Cells	on PCC: 0 on SCC1: 0 except reference cell: 0	The slot number offset at the transmitter between a neighbour cell and the assistance data reference cell. The corresponding parameter in the OTDOA assistance data is slotNumberOffset specified in TS 36.355 [24].
PRS muting info		Cell 1: '11110000' Cell 2: '00001111' Cell 3: '11110000' Cell 4: '00001111'	Cell 1: '1111111100000000' Cell 2: '0000000011111111' Cell 3: '1111111100000000' Cell 4: 0000000011111111'	Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	S		3	The length of the time interval from the beginning of each test
T2	S	1.28	2.48	The length of the time interval that follows immediately after time interval T1
Т3	S	1.28	2.48	The length of the time interval that follows immediately after time interval T2

Table A.8.17.10.1-2: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4
E-UTRA RF Channel Number		1	N/A	N/A	N/A
Channel Bandwidth (BW _{channel})	MHz	5,10,20	N/A	N/A	N/A
Correlation Matrix and Antenna Configuration		1x2 Low	1x2 Low	1x2 Low	1x2 Low
PCFICH/PDCCH/PHICH parameters as specified in clause A.3.1.2.1		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	N/A	N/A	N/A
OCNG patterns defined in A.3.2.1		5MHz: OP.18 FDD 10MHz: OP.5 FDD 20MHz: OP.13 FDD	N/A	N/A	N/A
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA ^{Note 1} OCNG_RB ^{Note 1}	dB	0	N/A	N/A	N/A
$N_{oc}^{ m Note 3}$	dBm/ 15 kHz	-95	N/A	N/A	N/A
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-Infinity	-Infinity	-Infinity	-Infinity
lo Note 4	dBm/ 9 MHz	-67.22 +10log (N _{RB,c} /50)	N/A	N/A	N/A
\hat{E}_s/N_{oc}	dB	0	-Infinity	-Infinity	-Infinity
Propagation Condition			ETU:	30	

Note 1: OCNG shall be used such that active cell (Cell 1) is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: lo levels have been derived from other parameters and are given for information purpose. These are not settable test parameters.

Table A.8.17.10.1-3: Cell-specific test parameters for E-UTRAN FDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Се	II 1	Cell 2 Cell		II 3	Cell 4	1	
		T2	Т3	T2	T3	T2	Т3	T2	T3
E-UTRA RF Channel Number		,	1	:	2	;	3	3	
Channel Bandwidth (BW _{channel})	MHz	,	0,20	·	0,20		0,20	5,10,2	
Correlation Matrix and Antenna Configuration		1x2	Low	1x2	Low	1x2 Low		1x2 Low	
PCFICH/PDCCH/PHICH parameters as specified in clause A.3.1.2.1		FI 10MH FI 20MHz	: R.11 DD z: R.6 DD z: R.10 DD	FI 10MH FI 20MH:	:: R.11 DD Iz: R.6 DD z: R.10 DD	FI 10MH FI 20MH:	:: R.11 DD Iz: R.6 DD z: R.10 DD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	N/A
OCNG patterns defined in A.3.2.1 (There is no PDSCH allocated in the subframe transmitting PRS)		FI 10MHz FI 20MHz	OP.18 DD 2: OP.5 DD : OP.13	5MHz: OP.19 FDD 10MHz: OP.6 FDD 20MHz: OP.14 FDD		5MHz: OP.19 FDD 10MHz: OP.6 FDD 20MHz: OP.14 FDD		5MHz: OP.19 FDD 10MHz: OP.6 FDD 20MHz: OP.14 FDD	N/A
PRS Transmission Bandwidth (PRS transmission bandwidth depends on selected channel bandwidth. PRS are transmitted over the system bandwidth)	RB	10MF	z: 25 Hz: 50 Hz:100	5MHz: 25 10MHz: 50 20MHz:100		5MHz: 25 10MHz: 50 20MHz:100		5MHz: 25 10MHz: 50 20MHz:100	N/A
Number of consecutive downlink positioning subframes $N_{\rm PRS}$. $N_{\rm PRS}$ also depends on selected channel bandwidth. As defined in TS 36.211 [16]. The number of subframes in a positioning occasion		5MHz: 2 10MHz: 1 20MHz:1		5MHz: 2 5MHz: 2 10MHz: 1 10MHz: 1 20MHz:1 20MHz:1		5MHz: 2 10MHz: 1 20MHz:1	N/A		
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA ^{Note 1} OCNG_RB ^{Note 1}	dB	()	0			0	0	N/A
PRS_RA	dB	-6	N/A	N/A	3	N/A	3	3	N/A
$N_{oc}^{$	dBm/ 15 kHz	-98	-98	-98	-95	-98	-95	-98	-95
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-4	- Infinity	- Infinity	-1	- Infinity	-1	-8	- Infinity
PRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}^{}$ Note 4	dB	-4	- Infinity	- Infinity	-1	- Infinity	-1	-8	- Infinity

Io Note 4	dBm/ 9 MHz	-69.94 +10log (N _{RB,c} /50)	N/A	N/A	-66.68 +10log (N _{RB,c} /50)	N/A	-66.68 +10log (N _{RB,c} /50)	-70.11 +10log (N _{RB,c} /50)	N/A
PRP Note 4	dBm/ 15 kHz	-102	- Infinity	- Infinity	-96	- Infinity	-96	-106	- Infinity
RSRP Note 4	dBm/ 15 kHz	-96	-96	-105	-99	-105	-99	-109	- Infinity
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 4}}$	dB	2	2	-7	-4	-7	-4	-11	- Infinity
Propagation Condition					E	TU30			

Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: If PRS_RA is not "N/A", \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters and are given for information purpose. If PRS_RA is "N/A", Io and RSRP levels have been derived from other parameters and are given for information purpose. These are not settable test parameters. Interference conditions shall be applied to all PRS symbols of DL positioning subframes.

Table A.8.17.10.1-4: DRX parameters for the test of E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Field	Value	Comment
onDurationTimer	psf1	
Drx-InactivityTimer	psf1	As appoiling in
drx-RetransmissionTimer	sf1	As specified in TS 36.331 [2], Clause 6.3.2
longDRX-CycleStartOffset	sf320	13 30.331 [2], Clause 6.3.2
shortDRX	Disable	

A.8.17.10.2 Test Requirements

The RSTD measurement time fulfils the requirements specified in Clause 8.4.

In Test 1, the UE shall perform and report the RSTD measurements from Cell 4 and Cell 3 within 2560 ms starting from the beginning of time interval T2.

In Test 2, the UE shall perform and report the RSTD measurements from Cell 1 and Cell 3, RSTD measurements from Cell 2 and Cell 3, and RSTD measurements from Cell 4 and Cell 3 within 4960 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Clause 9.1.10.3, i.e., between RSTD_0000 and RSTD_12711.

NOTE: The RSTD measurement times in the tests are derived from the following expression,

$$T_{PRS}(M-1)+160\left\lceil\frac{n}{M}\right\rceil$$

where M =8 and n =16 for Test 1, and M =16 and n =16 for Test 2. For Test 1, the M and n parameters specified in Clause 8.1.2.5.1, Table 8.1.2.5.1-1, under Note 1, which gives the total RSTD measurement time of 2560 ms for Cell 4 with respect to the reference cell Cell 3. For Test 2, the M and n parameters are specified in Clause 8.1.2.6.1, Table 8.1.2.6.1-1, under Note 1, which gives the total RSTD measurement time of 4960 ms for reporting the RSTD measurements of Cell 1, Cell 2 and Cell 4 with respect to the reference cell Cell 3.

A.8.17.11 E-UTRAN 3 DL TDD CA RSTD Measurement Reporting Delay Test Case

A.8.17.11.1 Test Purpose and Environment

The purpose of the test case is to verify that the RSTD measurements meet the requirements specified in Clause 8.4 in a synchronized network environment with fading propagation conditions. This test case will verify the measurement period requirements specified in Clause 8.4.3 for RSTD measurements performed on the same secondary component carrier, the measurement period requirements for RSTD measurements performed on both the primary and secondary component carriers specified in Clause 8.4.4, and also the measurement period requirements for RSTD measurements performed on different secondary component carriers specified in Clause 8.4.5.

In the tests, there are three configured component carriers: PCC, SCC1 and SCC2, and four synchronous cells: Cell 1, Cell 2, Cell 3 and Cell 4. Cell 1 is PCell on the PCC, Cell 2 is SCell on the SCC1, Cell 3 is SCell on the SCC2 and Cell 4 is a neighbour cell on the SCC2. In all tests, Cell 3 is the OTDOA assistance data reference cell.

The test case includes two tests. Test 1 is designed for the scenario where the UE receives OTDOA assistance data with cells only on SCC2, and the UE is expected to report RSTD measurements performed on SCC2 only. Test 2 is designed for the scenario where the UE receives OTDOA assistance data with cells on PCC, SCC1 and SCC2, and the UE is expected to report RSTD measurements performed on PCC, SCC1 and SCC2.

Each test consists of three consecutive time intervals, with duration of T1, T2 and T3. Cell 1 is active in T1, T2 and T3, Cell 2 is active only in T2 and T3, Cell 3 is active only during T2 and T3, and Cell 4 is active only during T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the OTDOA assistance data reference cell, where the PRS positioning occasion is as defined in Clause 8.1.2.5.1. Cell 1 transmits PRS in T2, Cell 2 transmits PRS only in T3, and Cell 3 transmits PRS only in T3, and Cell 4 transmits PRS only in T2.

Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

The test parameters are as given in Table A.8.17.11.1-1, Table A.8.17.11.1-2, Table A.8.17.11.1-3 and Table A.8.17.11.1-4.

Table A.8.17.11.1-1: General test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Parameter	Unit	Valu	ıe	Comment
		Test 1	Test 2	

PCell		Ce	ell 1	PCell is on RF channel 1 (PCC).		
SCell 1			ll 2	SCell 1 on RF channel 2 (SCC1).		
				SCell 2 on RF channel 3 (SCC2).		
SCell 2		Ce	ell 3	Cell 3 is the assistance data		
				reference cell.		
Other neighbor cell		Ce	ell 4	Neighbor cell on RF channel 3		
PCFICH/PDCCH/PHIC		DI Poforonoo	Measurement	(SCC2).		
H parameters			R.6 TDD	As specified in clause A.3.1.2.2		
Channel Bandwidth				All channels in a test have the same		
(BW _{channel})	MHz	5MHz or 10M	lHz or 20MHz	bandwidth.		
				This corresponds to periodicity of		
PRS configuration index		174 for all o	ells on PCC	320 ms and PRS subframe offset of		
$I_{\rm PRS}$		184 for all ce	ells on SCC1	I_{PRS} -160 DL subframes, as		
*PRS		194 for all ce	ells on SCC2	defined in TS 36.211 [16], Table		
				6.10.4.3-1		
				The PCIs of Cell 1 and Cell 2 are		
				selected randomly. PCIs of Cell 3		
Physical cell ID PCI		,	B – PCI of Cell	and Cell 4 are selected randomly		
		4)mc	od6=0	such that the relative subcarrier shifts of PRS patterns among these		
				cells are as given by the condition		
				As specified in TS 36.211 [16],		
				Clause 4.2; corresponds to a		
TDD uplink-downlink			1	configuration with 5 ms switch-point		
configuration				periodicity and two downlink		
				consecutive subframes		
				As specified in TS 36.211 [16],		
TDD special subframe			6	Clause 4.2; corresponds to DwPTS		
configuration		'	J	of $19760 \cdot T_{\mathrm{s}}$ and UpPTS of		
				$4384 \cdot T_{\rm s}$		
CP length		Nor	mal			
DRX		С	N	DRX parameters are further		
Dadio frama rassiva				specified in Table A.8.17.11.1-3		
Radio frame receive time offset between the		Cell 1 to		PRS are transmitted from		
cells at the UE antenna	μs		Cell 2: -1 Cell 2: 3	synchronous cells		
connector						
Time alignment errors		•	ment error as	The value of time alignment error		
among cell1, cell2 and cell3	μs		P TS 36.104 [30] 6.5.3.1.	depends upon the type of carrier aggregation.		
Celio		Clause	Cell 1: -2	aggregation.		
		Cell 4: 2	Cell 2: 0	The expected RSTD is what is		
		Other	Cell 4: 2	expected at the receiver. The		
Expected DCTD		neighbour cells:	Other	corresponding parameter in the		
Expected RSTD	μs	randomly	neighbour cells:	OTDOA assistance data specified in		
		between -3 and	randomly	TS 36.355 [24] is the		
		3	between -3 and	expectedRSTD indicator		
			3	The corresponding parameter in the		
Expected RSTD				The corresponding parameter in the OTDOA assistance data specified in		
uncertainty for all	μs		5	TS 36.355 [24] is the		
neighbour cells		5		expectedRSTD-Uncertainty index		
1				Expediento i D-Officertainty index		
Cells in OTDOA		40 "	s in total	The list includes the reference cell		

		OTDOA neighbor cells include Cell 4 and other 14 cells on SCC2	OTDOA neighbor cells include Cell 1 and other 3 cells on PCC, Cell 2 and other 3 cells on SCC1 and Cell 4 and other 6 cells on SCC2	ReferenceCellInfo [24]) and 15 other cells, all received in OTDOA-ProvideAssistanceData [24]. Cell 1 and Cell 2 (when included) appears at random places in the first half of the neighbour cell list in the OTDOA assistance data. Cell 4 always appears at random places in the second half of the list.
prs-SubframeOffset		Cells on P Cells on SC Cells on SCC2, e cell:	CC1: 320 xcept reference	Subframe offset, counted in full subframes. The corresponding parameter in the OTDOA assistance data is prs-SubframeOffset specified in TS 36.355 [24]
slotNumberOffset		Cells on Cells on S Cells on SCC2, e cell:	SCC1: 0 xcept reference	The slot number offset at the transmitter between a neighbour cell and the assistance data reference cell. The corresponding parameter in the OTDOA assistance data is slotNumberOffset specified in TS 36.355 [24].
PRS muting info		Cell 1: '11110000' Cell 2: '00001111' Cell 3: '11110000' Cell 4: '00001111'	Cell 1: '11111111000 00000' Cell 2: '00000000111 11111' Cell 3: '11111111000 00000' Cell 4: 00000000111 11111'	Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	S	3		The length of the time interval from the beginning of each test
T2	S	1.28	2.48	The length of the time interval that follows immediately after time interval T1
ТЗ	S	1.28	2.48	The length of the time interval that follows immediately after time interval T2

Table A.8.17.11.1-2: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T1 for carrier aggregation

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4
E-UTRA RF Channel		1	N/A	N/A	N/A
Number		•	19/73	IN//A	14/74
Channel Bandwidth	MHz	5,10,20	N/A	N/A	N/A
(BW _{channel})	IVII IZ				-
Correlation Matrix and		1x2 Low	1x2 Low	1x2 Low	1x2 Low
Antenna Configuration					
		5MHz: R11			
PCFICH/PDCCH/PHICH		TDD			
parameters as specified		10MHz: R6	N/A	N/A	N/A
in clause A.3.1.2.1		TDD	IN/A	IN/A	19/73
III clause A.s. 1.2.1		20MHz: R10			
		TDD			
		5MHz: OP.10			
		TDD			
OCNG patterns defined		10MHz: OP.1	N/A	N/A	N/A
in A.3.2.2		TDD	IN/A	IN/A	19/73
		20MHz: OP.7			
		TDD			
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA	dB	0	N/A	N/A	N/A
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
OCNG_RA ^{Note 1}					
OCNG_RB ^{Note 1}					
$N_{oc}^{ m Note 3}$	dBm/	-95	N/A	N/A	N/A
IV oc	15 kHz	-90	IN/A	IN/A	IN/A
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-Infinity	-Infinity	-Infinity	-Infinity
	dBm/	-67.22			
Io Note 4	9 MHz	+10log	N/A	N/A	N/A
	J IVII IZ	(N _{RB,c} /50)			
$\hat{\mathbf{E}}_{s}/N_{oc}$	dB	0	-Infinity	-Infinity	-Infinity
Propagation Condition			ETU:	30	

Note 1: OCNG shall be used such that active cell (Cell 1) is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: lo levels have been derived from other parameters and are given for information purpose. These are not settable test parameters.

Table A.8.17.11.1-3: Cell-specific test parameters for E-UTRAN TDD RSTD measurement reporting delay under fading propagation conditions during T2 and T3 for carrier aggregation

Parameter	Unit	Ce	Cell 1		II 2	Се	II 3	Cell 4	
		T2	T3	T2	Т3	T2	T3	T2	T3

				1		1		ı	
E-UTRA RF Channel Number		1	1	:	2	;	3	3	
Correlation Matrix and		1x2	Low	1x2	Low	1x2	Low	1x2 Lo	w
Antenna Configuration									
Channel Bandwidth (BW _{channel})	MHz	5,10	0,20	5,1	0,20	5,1	0,20	5,10,2	0
PCFICH/PDCCH/PHICH parameters as specified in clause A.3.1.2.1		5MHz TE 10MH TE 20MH:	DD Iz: R6 DD z: R10	TI 10MH TI 20MH	z: R11 DD Hz: R6 DD z: R10 DD	TI 10MH TI 20MH	z: R11 DD Hz: R6 DD z: R10 DD	5MHz: R11 TDD 10MHz: R6 TDD 20MHz: R10 TDD	N/A
OCNG patterns defined in A.3.2.1		TE 10MHz TE 20MHz	5MHz: OP.10 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		TDD 10MHz: OP.1 TDD		OP.10 DD z: OP.1 DD z: OP.7 DD	5MHz: OP.10 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	N/A
PRS Transmission Bandwidth (PRS transmission bandwidth depends on selected channel bandwidth. PRS are transmitted over the system bandwidth)	RB	5MHz: 25 10MHz: 50 20MHz:100		10MF	lz: 25 Hz: 50 Hz:100	5MHz: 25 10MHz: 50 20MHz:100		5MHz: 25 10MHz: 50 20MHz:100	N/A
Number of consecutive downlink positioning subframes $^{N_{\mathrm{PRS}}}$. $^{N_{\mathrm{PRS}}}$ also depends on selected channel bandwidth. As defined in TS 36.211 [16]. The number of subframes in a positioning occasion		10MI	5MHz: 2 10MHz: 1 20MHz:1		Hz: 2 Hz: 1 IHz:1	5MHz: 2 10MHz: 1 20MHz:1		5MHz: 2 10MHz: 1 20MHz:1	N/A
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA ^{Note 1} OCNG_RB ^{Note 1}	dB	C)	0			0	0	N/A
PRS_RA	dB	-6	N/A	N/A	3	N/A	3	3	N/A
N_{oc} Note 3	dBm/ 15 kHz	-98	-98	-98	-95	-98	-95	-98	-95
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-4	- Infinity	- Infinity	-1	- Infinity	-1	-8	- Infinity
PRS $\hat{E}_{_{s}}/I_{_{ot}}^{}$ Note 4	dB	-4	- Infinity	- Infinity	-1	- Infinity	-1	-8	- Infinity
l						<u> </u>		1	

Io Note 4	dBm/ 9 MHz	-69.94 +10log (N _{RB,c} /50)	N/A	N/A	-66.68 +10log (N _{RB,c} /50)	N/A	-66.68 +10log (N _{RB,c} /50)	-70.11 +10log (N _{RB,c} /50)	N/A
PRP Note 4	dBm/ 15 kHz	-102	- Infinity	- Infinity	-96	- Infinity	-96	-106	- Infinity
RSRP Note 4	dBm/ 15 kHz	-96	-96	-105	-99	-105	-99	-109	- Infinity
$\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$ Note 4	dB	2	2	-7	-4	-7	-4	-11	- Infinity
Propagation Condition		ETU30							

- Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: If PRS_RA is not "N/A", \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters and are given for information purpose. If PRS_RA is "N/A", Io and RSRP levels have been derived from other parameters and are given for information purpose. These are not settable test parameters. Interference conditions shall be applied to all PRS symbols of DL positioning subframes.

Table A.8.17.11.1-4: DRX parameters for the test of E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions for carrier aggregation

Field	Value	Comment		
onDurationTimer	psf1			
Drx-InactivityTimer	psf1	A a an a siti and in		
drx-RetransmissionTimer	sf1	As specified in TS 36.331 [2], Clause 6.3.2		
longDRX-CycleStartOffset	sf320	- 13 30.331 [2], Clause 0.3.2		
shortDRX	Disable			

A.8.17.11.2 Test Requirements

The RSTD measurement time fulfils the requirements specified in Clause 8.4.

In Test 1, the UE shall perform and report the RSTD measurements from Cell 4 and Cell 3 within 2560 ms starting from the beginning of time interval T2.

In Test 2, the UE shall perform and report the RSTD measurements from Cell 1 and Cell 3, RSTD measurements from Cell 2 and Cell 3, and RSTD measurements from Cell 4 and Cell 3 within 4960 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Clause 9.1.10.3, i.e., between RSTD_0000 and RSTD_12711.

NOTE: The RSTD measurement times in the tests are derived from the following expression,

$$T_{PRS}(M-1)+160\left\lceil\frac{n}{M}\right\rceil,$$

where M =8 and n =16 for Test 1, and M =16 and n =16 for Test 2. For Test 1, the M and n parameters specified in Clause 8.1.2.5.1, Table 8.1.2.5.1-1, under Note 1, which gives the total RSTD measurement time of 2560 ms for Cell 4 with respect to the reference cell Cell 3. For Test 2, the M and n parameters are specified in Clause 8.1.2.6.1, Table 8.1.2.6.1-1, under Note 1, which gives the total RSTD measurement time of 4960 ms for reporting the RSTD measurements of Cell 1, Cell 2 and Cell 4 with respect to the reference cell Cell 3.

A.8.18 E-UTRAN TDD – HRPD Measurements

A.8.18.1 E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions

A.8.18.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN TDD- HRPD cell search requirements in clause 8.1.2.4.12.

The test parameters are given in Tables A.8.18.1.1-1, A.8.18.1.1-2 and A.8.18.1.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.18.1.1-1: General test parameters for E-UTRAN TDD to HRPD event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	E-UTRAN TDD cell
Neighbouring cell		Cell 2	HRPD cell
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
E-UTRAN TDD measurement quantity		RSRP	
Inter-RAT (HRPD) measurement quantity		CDMA2000 HRPD Pilot Strength	
b1-ThresholdCDMA2000	dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B1
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	Non-DRX test
Access Barring Information	-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
HRPD RF Channel Number		1	One HRPD carrier frequency is used.
HRPD neighbour cell list size		8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize		8 (60 PN chips)	Search window size as defined in clause 6.3.5 in TS 36.331
T1	S	5	
T2	S	3	

Table A.8.18.1.1-2: Cell specific test parameters for E-UTRAN TDD cell#1 for event triggered reporting under fading propagation conditions

Parameter	Unit	Cell 1 (I	E-UTRA)	
		T1	T2	
E-UTRA RF Channel			1	
number				
BW _{channel}	MHz	1	0	
Correlation Matrix and		1x2	Low	
Antenna Configuration				
OCNG Patterns defined in		OP.1	TDD	
TS36.133 A.3.2.2.1 (OP.1				
TDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB	0		
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB	1		
PDSCH_RB	dB	1		
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
N_{oc} Note 2	dBm/15	-(98	
	kHz			
RSRP Note 3	dBm/15	-98	-98	
	KHz			
\hat{E}_s/N_{oc}	dB	0	0	
\hat{E}_s/I_{ot}	dB	0	0	
Propagation Condition		ET	U70	
	ed such that	both cells are fully		
		r spectral density is		
OFDM symbols.	•			
	other cells an	d noise sources no	t specified in the	

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

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

Table A.8.18.1.1-3: Cell specific test parameters for HRPD (cell # 2) for event triggered reporting under fading propagation conditions

Parameter	Unit	Cell 2 (HRPD)	
		T1	T2
$\frac{\text{Control} E_b}{N_t} \text{(38.4 kbps)}$	dB	2	21
$\frac{\text{Control} E_{b}}{N_{t}} $ (76.8 kbps)	dB	1	8
\hat{I}_{or}/I_{oc}	dB	-infinity	0
I_{oc}	dBm/1.2288 MHz		55
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3
Propagation Condition		ET	U70

A.8.18.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 2134 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.19 E-UTRAN TDD – CDMA2000 1X Measurements

A.8.19.1 E-UTRAN TDD – CDMA2000 1X event triggered reporting under fading propagation conditions

A.8.19.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN TDD- CDMA2000 1X cell search requirements in clause 8.1.2.4.10.

The test parameters are given in Tables A.8.19.1.1-1, A.8.19.1.1-2 and A.8.19.1.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.19.1.1-1: General test parameters for E-UTRAN TDD-CDMA2000 1X event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement	As specified in clause A.3.1.1.2.
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in clause A.3.1.2.2.
(E-UTRAN TDD)		Channel R.6 TDD	
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on CDMA2000 1X RF channel
			number 1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
			Applicable to cell 1.
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211.
			Applicable to cell 1.
CP length		Normal	Applicable to cell 1.
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
CDMA2000 1X Channel Number		1	One CDMA2000 1X carrier frequency is used.
Inter-RAT (CDMA2000 1X)		CDMA2000 1xRTT Pilot	
measurement quantity		Strength	
B1-Threshold-CDMA2000	dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength'
			threshold for event B1
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
cdma2000 1X neighbour cell list size		8	cdma2000 1X cells on cdma2000 1X RF
-			channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize		8 (60 PN chips)	Search window size as defined in
			clause 6.3.5 in TS 36.331
T1	S	5	
T2	S	3	

Table A.8.19.1.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of CDMA2000 1X cell under fading propagation conditions

Parameter	Unit	Cell	11
		T1	T2
E-UTRA RF Channel Number		1	
BW _{channel}	MHz	10)
Correlation Matrix and		1x2 L	_OW
Antenna Configuration			
OCNG Pattern defined in			
A.3.2.2.1 (OP.1 TDD)		OP.1	TDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG_RB ^{Note 1}	dB		
\hat{E}_{s}/I_{ot}	dB	4	4
\hat{E}_s/N_{oc}	dB	4	4
N_{oc}	dBm/15 kHz	-98	3
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		ETU	70
	such that both ce	ells are fully allocated and a con-	

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

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.19.1.1-3: Cell specific test parameters for CDMA2000 1X (cell # 2) for event triggered reporting of CDMA2000 1X cell under fading propagation conditions

Parameter	Unit	Cell 2 (cdma2000 1X)		
		T1	T2	
$\frac{\text{Pilot} \text{E}_{\text{c}}}{\text{I}_{\text{or}}}$	dB		-7	
$\frac{\text{Sync} \ \text{E}_{\text{c}}}{\text{I}_{\text{or}}}$	dB	-16		
$\frac{\text{Paging} \text{E}_{\text{c}}}{\text{I}_{\text{or}}} \text{(4.8 kbps)}$	dB	-12		
\hat{I}_{or}/I_{oc}	dB	-infinity 0		
I_{oc}	dBm/1.2288 MHz	-	55	
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10	
Propagation Condition		ET	TU70	

A.8.19.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 2134 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.20 Inter-frequency/RAT Measurements in CA mode

A.8.20.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

It is not necessary for CA UEs to be tested in A.8.3.1 if this case is done.

A.8.20.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD-FDD inter-frequency cell search requirements in clause 8.1.2.3.

The test parameters are given in Tables A.8.20.1.1-1 and A.8.20.1.1-2. In this test, there are three cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.20.1.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
E-UTRA RF Channel Number for Scell		3	One FDD carrier frequencies is used
Channel Bandwidth (BWchannel)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active Scell		Cell 3	Cell 3 is on RF channel number 3
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Cell2 timing offset to cell1	ms	3	Asynchronous cells
Cell3 timing offset to cell1	μs	0	Synchronous cells
Time alignment error between cell3 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	S	5	
T2	S	5	

Table A.8.20.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2		Cell 3		
		T1	T2	T1	T2	T1	T2	
E-UTRA RF		1			2	3	3	
Channel Number								
BW _{channel}	MHz	10		,	10	11	0	
Correlation Matrix		1x2 Low		1x2	2 Low	1x2	Low	
and Antenna								
Configuration								
OCNG Patterns								
defined in		OP.1	FDD	OP.2	2 FDD	OP.1	FDD	
A.3.2.1.1 (OP.1								
FDD) and in								
A.3.2.1.2 (OP.2								
FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB	_		0		0		
PHICH_RB	dB	0						
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
N _{oc Note 3}	dBm/15 kHz				-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	-94	-94	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	4	4	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	-94	-94	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	4	4	
Propagation Condition		ETU70						
	nall be used such achieved for all C			located and a	constant total tra	ansmitted powe	r spectral	

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\it ac}$ to be fulfilled.

RSRP and SCH RP levels have been derived from other parameters for information purposes. They are not Note 4: settable parameters themselves

A.8.20.1.2 **Test Requirements**

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement NOTE: reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.20.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

It is not necessary for CA UEs to be tested in A.8.4.1 if this case is done.

A.8.20.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD-TDD inter-frequency cell search requirements in clause 8.1.2.3.4.

The test parameters are given in Table A.8.20.2.1-1 and A.8.20.2.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.20.2.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
		DL Reference Measurement	
PDSCH parameters		Channel R.0 TDD	As specified in clause A.3.1.1.2
		DL Reference Measurement	
PCFICH/PDCCH/PHICH		Channel R.6 TDD	As specified in clause A.3.1.2.2
parameters			
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
			The same configuration in both cells
Uplink-downlink configuration		1	As specified in TS 36.211 clause 4.2
			Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
E-UTRA RF Channel Number		3	One TDD carrier frequencies is used
for Scell			
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active Scell		Cell 3	Cell 3 is on RF channel number 3
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Cell2 timing offset to cell1	μs	3	Synchronous cells
Cell3 timing offset to cell1	μs	0	Synchronous cells
Time alignment error between	μs	≤ Time alignment error as	The value of time alignment error
cell3 and cell1	_	specified in 3GPP TS 36.104	depends upon the type of carrier
		[30] clause 6.5.3.1.	aggregation.
T1	S	5	
T2	S	10	

Table A.8.20.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Unit Cell 1 Cell 2		Cell 3				
		T1	T2	T1	T2	T1	T2	
E-UTRA RF		1		2		3		
Channel Number					-		-	
BW _{channel}	MHz	10		1	0	1	0	
Correlation Matrix		1x2 Low		1x2	Low	1x2	Low	
and Antenna								
Configuration								
OCNG Pattern								
defined in		OP.1	TDD	OP.2	TDD	OP.1	TDD	
A.3.2.2.1 (OP.1								
TDD) and in								
4.3.2.2.2 (OP.2)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB			0		0		
PHICH_RB	dB	0)					
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	4	4	
$N_{oc}^{ m Note 3}$	dBm/15 kHz				-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	-94	-94	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91	-94	-94	
$\frac{\bar{E}_s/N_{oc}}$	dB	4	4	-Infinity	7	4	4	
Propagation Condition		ETU70						

Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.20.2.2 **Test Requirements**

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.20.2A E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth.

A.8.20.2A.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.20.2. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.20.2A.1-1 and A.8.20.2A.1-2 will replace the values of corresponding parameters in Tables A.8.20.2.1-1 and A.8.20.2.1-2.

Table A.8.20.2A.1-1: General test parameters for E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth

Parameter	Parameter Unit		Comment				
PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.2				
		Channel R.3 TDD					
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2				
parameters		Channel R.10 TDD	·				
Channel Bandwidth (BW _{channel})	MHz	20					
Note 1: See Table A.8.20.2.1-	Note 1: See Table A.8.20.2.1-1 for other general test parameters.						
Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according							
to the principle define	to the principle defined in section A.3.6.1.						

Table A.8.20.2A.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3		
		T1 T2		T1	T2	T1	T2	
BW _{channel}	MHz	20		20		20		
OCNG Pattern								
defined in A.3.2.2		OP.7 TDD		OP.8 TDD		OP.7 TDD		
Note 1: See Table A.8.20.2.1-1 for other general test parameters.								

A.8.20.2A.2 Test Requirements

The test requirements defined in section A.8.20.2.2 shall apply to this test case.

A.8.20.2B E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth.

A.8.20.2B.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.8.20.2. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8.20.2B.1-1 and A.8.20.2B.1-2 will replace the values of corresponding parameters in Tables A.8.20.2.1-1 and A.8.20.2.1-2.

Table A.8.20.2B.1-1: General test parameters for E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth

Parameter	Unit	Value	Comment
Channel bandwidth for Cell 1 (BW _{channel})	MHz	20	
PDSCH parameters for Cell 1		DL Reference Measurement	As specified in section
		Channel R.3 TDD	A.3.1.1.2
PCFICH/PDCCH/PHICH parameters for		DL Reference Measurement	As specified in section
Cell 1		Channel R.10 TDD	A.3.1.2.2
Channel bandwidth for Cells 2, 3	MHz	10	
(BW _{channel})	IVII IZ	10	
PDSCH parameters for Cells 2, 3		DL Reference Measurement	As specified in section
		Channel R.0 TDD	A.3.1.1.2
PCFICH/PDCCH/PHICH parameters for		DL Reference Measurement	As specified in section
Cells 2, 3		Channel R.6 TDD	A.3.1.2.2
PCFICH/PDCCH/PHICH parameters for		Channel R.0 TDD DL Reference Measurement Channel R.6 TDD	A.3.1.1.2 As specified in section

Note 1: See Table A.8.20.2.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.20.2B.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3		
		T1	T2	T1	T2	T1	T2	
BW _{channel}	MHz	20		10		10		
OCNG Pattern								
defined in A.3.2.2		OP.7 TDD		OP.2 TDD		OP.1 TDD		
Note 1: See Table A.8.20.2.1-1 for other general test parameters.								

A.8.20.2B.2 Test Requirements

The test requirements defined in section A.8.20.2.2 shall apply to this test case.

A.8.20.3 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

It is not necessary for CA UEs to be tested in A.8.5.1 if this case is done.

A.8.20.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN FDD- UTRAN FDD cell search requirements in clause 8.1.2.4.1.

The test parameters are given in Tables A.8.20.3.1-1, A.8.20.3.1-2 and A.8.20.3.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.20.3.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN		DL Reference Measurement	As specified in clause A.3.1.1.1.
FDD)		Channel R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1.
parameters		Channel R.6 FDD	
(E-UTRAN FDD)			
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Configured active Scell		Cell 3	Cell 3 is on E-UTRA RF channel number 2.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA RF Channel Number for		2	One E-UTRA FDD carrier frequency is
Scell			used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	S	5	
T2	S	6	

Table A.8.20.3.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1, cell # 3) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 1		Cell 3		
		T1	T2	T1	T2	
E-UTRA RF Channel		1		2		
Number						
BW _{channel}	MHz	10)	10		
Correlation Matrix		1x2 l	_OW	1x2 L	ow	
and Antenna						
Configuration						
OCNG Pattern						
defined in A.3.2.1.1		OP.1	FDD	OP.1 F	FDD	
(OP.1 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0		0		
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	4		
\hat{E}_s/N_{oc}	dB	4	4	4		
N_{oc}	dBm/15		-	98		
	kHz	0.4	0.4	T	,	
RSRP	dBm/15 kHz	-94	-94	-94		
SCH_RP	dBm/15	-94	-94	-94	ļ	
	kHz					
Propagation Condition			ET	TU70		

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

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table A.8.20.3.1-3: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell	12		
		T1	T2		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.94	11		
\hat{I}_{or}/I_{oc}	dB	-Infinity	-1.8		
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/lo	dB	-Infinity	-14		
Propagation Condition		Case 5 (N	Note 3)		

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}

Note3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.

A.8.20.3.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.20.4 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions

It is not necessary for CA UEs to be tested in A.8.7.1 if this case is done.

A.8.20.4.1 Test Purpose and Environment

A.8.20.4.1.1 1.28 Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRA TDD to UTRA TDD cell search requirements in clause 8.1.2.4.3 under fading propagation conditions.

This test scenario comprised of 1 E-UTRA TDD PCell, 1 E-UTRA TDD SCell and 1 UTRA TDD cell to be searched. Test parameters are given in Table A.8.20.4.1.2-1, A.8.20.4.1.2-2, and A.8.20.4.1.2-3. Gap pattern configuration #0 as defined in table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.20.4.1.1-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA RF Channel Number for Scell		2	One E-UTRA TDD carrier frequency is used.
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Configured active SCell		Cell 3	E-UTRA TDD cell
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	S	5	
T2	S	10	

Table A.8.20.4.1.1-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 1, cell3)

Parameter	Unit	Ce	Cell 1		Cell 3	
		T1	T2	T1	T2	
E-UTRA RF Channel Number			1		2	
BW _{channel}	MHz	10		10		
Correlation Matrix and Antenna		1x2	Low	1x2 Low		
Configuration						
OCNG Pattern defined in A.3.2.2.1 (OP.1		OP 1	TDD	OP	1 TDD	
TDD)		01.1		01.	1 100	
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0	0	0	0	
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note1}	dB					
OCNG_RB ^{Note1}	dB					
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	9	9	9	9	
\hat{E}_s/N_{oc}	dB	9	9	9	9	
N _{oc}	dBm/15kHz	-98		•		
RSRP	dBm/15kHz	-89	-89	-89	-89	
SCH_RP	dBm/15kHz	-89	-89	-89	-89	
Propagation Condition			ET	Ú70	•	

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

The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 2:

Table A.8.20.4.1.1-3: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)				
Timeslot Number		()	DwPTS		
		T1	T2	T1	T2	
UTRA RF Channel Number NOTE1		Channel 2				
PCCPCH_Ec/lor	dB	-3	-3			
DwPCH_Ec/lor	dB			0	0	
OCNS_Ec/lor ^{NO1E2}	dB	-3	-3			
\hat{I}_{or}/I_{oc}	dB	-inf	5	-inf	5	
I_{oc}	dBm/1.2 8 MHz	-80				
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.	
Propagation Condition			Case 3 ^{NOTE3}			

In the case of multi-frequency cell, the UTRA RF Channel Note 1:

Number is the primary frequency's channel number. The power of the OCNS channel that is added shall make Note 2: the total power from the cell to be equal to $\ensuremath{\text{I}_{or}}\xspace$

Case 3 propagation conditions are defined in Annex B of Note 3: TS 25.102

A.8.20.4.2 Test Requirements

A.8.20.4.2.1 1.28 Mcps TDD option

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 6400 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.20.4A E-UTRAN TDD with 20 MHz +20 MHz bandwidth to UTRAN TDD cell search under fading propagation conditions

A.8.20.4A.1 Test Purpose and Environment

A.8.20.4A.1.1 1.28 Mcps TDD option

The purpose of this test case is the same as for the test defined in subclause A.8.20.4. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8. 20.4A.1.1-1 and A.8. 20.4A.1.1-2 will replace the values of corresponding parameters in Tables A.8. 20.4.1.1-1 and A.8. 20.4.1.1-2.

Table A.8.20.4A.1.1-1: General test parameters for E-UTRA TDD with 20MHz +20MHz bandwidth to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

	Parameter	Unit	Value	Comment		
PDSCH p	parameters		DL Reference Measurement	As specified in section		
			Channel R.3 TDD	A.3.1.1.2		
PCFICH/F	FICH/PDCCH/PHICH		DL Reference Measurement	As specified in section		
paramete	ameters		Channel R.10 TDD	A.3.1.2.2		
Note 1:	See Table A.8.20.4.1.1-1	or other	general test parameters.			
Note 2:	Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed					
	according to the principle defined in section A.3.6.1.					

Table A.8.20.4A.1.1-2: Cell specific test parameters for cell search E-UTRA TDD with 20MHz +20MHz bandwidth to UTRA TDD test case (cell 1, cell3)

Unit	Cell 1		Ce	II 3		
	T1	T2	T1	T2		
MHz	20		20			
	OP.7 TDD OP.7 TDD			TDD		
	ETU70					
Note 1: See Table A.8.20.4.1.1-2 for other general test parameters.						
Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.						
	MHz r general test parament which is inde	MHz 2 OP.7 r general test parameters. ment which is independent of o	MHz 20 OP.7 TDD r general test parameters. ment which is independent of channel band	T1 T2 T1 MHz 20 2 OP.7 TDD OP.7 ETU70 r general test parameters. ment which is independent of channel bandwidth and in		

A.8.20.4A.2 Test Requirements

A.8.20.4A.2.1 1.28 Mcps TDD option

The test requirements defined in section A.8.20.4.2.1 shall apply to this test case.

A.8.20.4B E-UTRAN TDD with 20 MHz +10 MHz bandwidth to UTRAN TDD cell search under fading propagation conditions

A.8.20.4B.1 Test Purpose and Environment

A.8.20.4B.1.1 1.28 Mcps TDD option

The purpose of this test case is the same as for the test defined in subclause A.8.20.4. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.8. 20.4B.1.1-1 and A.8. 20.4B.1.1-2 will replace the values of corresponding parameters in Tables A.8. 20.4.1.1-1 and A.8. 20.4.1.1-2.

Table A.8.20.4B.1.1-1: General test parameters for E-UTRA TDD with 20MHz +10MHz bandwidth to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

Parameter	Unit	Value	Comment
Channel bandwidth for Cell 1 (BW _{channel})	MHz	20	
PDSCH parameters for Cell 1		DL Reference Measurement Channel R.3 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters for Cell 1		DL Reference Measurement Channel R.10 TDD	As specified in section A.3.1.2.2
Channel bandwidth for Cell 3 (BW _{channel})	MHz	10	
PDSCH parameters for Cell 3		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters for Cell 3		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2

Note 1: See Table A.8.20.4.1.1-1 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.20.4B.1.1-2: Cell specific test parameters for cell search E-UTRA TDD with 20MHz +10MHz bandwidth to UTRA TDD test case (cell 1, cell3)

Parameter	Unit	Cell 1		Cell 3	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
BW _{channel}	MHz	20		10	
OCNG Pattern defined in A.3.2.2		OP.7 TDD		OP.1 TDD	

Note 1: See Table A.8.20.4.1.1-2 for other general test parameters.

Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

A.8.20.4B.2 Test Requirements

A.8.20.4B.2.1 1.28 Mcps TDD option

The test requirements defined in section A.8.20.4.2.1 shall apply to this test case.

A.8.21 CSG Proximity Indication Testing Case for E-UTRAN FDD – FDD Inter frequency

Note: The test case in this section forms the basis for a signalling test for CSG proximity detection.

A.8.21.1 Test Purpose and Environment

The purpose of this test is to verify the UE has implemented properly the feature for indicating that the UE is entering or leaving the proximity of one or more CSG member cells based on proximity detection with an autonomous search function, as defined by the requirements in Section 6.4.

The test case consists of three successive segments: Test Preparation, Negative Test, and Positive Test. The test scenario comprises of three E-UTRAN FDD cells on different carriers. Cell 1 represents the serving cell in the proximity of the CSG cell, Cell 2 the CSG cell, and Cell 3 the serving cell not in the proximity of the CSG cell. The description of the test procedure is shown in Table A.8.21-1. The general test parameters and cell specific test parameters are presented in Table A.8.21-2 and Table A.8.21-3 respectively.

Table A.8.21-1: Description of the test procedures

Parameter	Cell Status	Comment			
Test Preparation					
Initial Condition	Cell 1 is active	Clean up the UE memory to be free from previously stored cell information for proximity detection. Turn on the UE and allow sufficient time for the UE to select to Cell 1.			
Time duration T1	Cell 1 and Cell 2 are active	Turn on Cell 2 at the start of T1. Perform manual CSG selection towards Cell 2. The UE is expected to store necessary information for later proximity detection.			
End condition		Turn off the UE. Turn off Cell 1 and Cell 2.			
		Negative Test			
Initial Condition	Cell 3 is active	Turn on Cell 3. Turn on the UE and set up the UE in connected mode with Cell 3			
Time duration T2	Cell 3 is active	Configure the UE with proximity indication control by sending the Reconfiguration message with ReportProximityConfig at the start of T2. The UE is not expected to report "entering" proximity in the negative test.			
End condition		Turn off the UE. Turn off Cell 3.			
	•	Positive Test			
Initial Condition	Cell 1 is active	Turn on Cell 1. Turn on the UE and set up the UE in connected mode with Cell 1.			
Time duration T3	Cell 1 and Cell 2 are active	Turn on Cell 2 at the start of T3. Configure the UE with proximity indication control by sending the Reconfiguration message with reportProximityConfig at the start of T3. The UE is expected to report "entering" proximity before end of T3.			
End condition		Turn off the UE. Turn off Cell 1 and Cell 2.			

Table A.8.21-2: General test parameters for E-UTRAN FDD-FDD inter frequency cell proximity detection test case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PDSCH allocation	n_{PRB}	2—3	13—36
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
A3-Offset	dB	-4	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		off	As specified in section A.3.3
PRACH configuration		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
Access Barring Information	-	Not sent	No additional delays in random access procedure
Time offset between cells		3 ms	Asynchronous cells
Gap pattern configuration Id		0	As specified in Table 8.1.2.1-1 started before T1 starts
Time duration T1	S	[10]	Defined to give enough time for the UE to complete the manual reselection to Cell 2.
Time duration T2	S	[360]	Defined to be longer enough to see whether the UE will report enter "proximity" indication.
Time duration T3 Note 1	S	[<=360]	The time duration for a UE to report enters "proximity" when the UE is near a CSG cell.

Note 1: The maximum allowed time duration for the UE to decide either entering or leaving "proximity" is 360s.

To reduce test time, T3 may end once UE reports entering "proximity".

The test case assumes an environment where CSG proximity detection results not being impact by non-Note 2: 3GPP signals, such as GPS and WiFi. When the test case is being executed, the UE may ignore any radio signals which are not provided by the test setup which it would otherwise use in proximity estimation.

Table A.8.21-3: Cell specific test parameters for E-UTRAN FDD-FDD inter frequency cell proximity detection test case

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	Т3	T1	T2	T3
E-UARFCN		Channel 1			Channel 2		
CSG indicator			False		True	N/A	True
Physical cell global		1	1	1	2	N/A	2
identity							
CSG identity			Not sent		Sent N/A Sent		
BW _{channel}	MHz	10			10		
OCNG Patterns		OP.1 FDD	N/A	OP.2 FDD	OP.2	N/A	OP.2
defined in A.3.2.1.1					FDD		FDD
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		0				
PHICH_RB	dB		U		0		
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RANote 1	dB						
OCNG_RB ^{Note 1}	dB			T		1	
\hat{E}_s/I_{ot}	dB	0	-inf	4	7	-inf	7
N_{oc} Note 2	dBm/15 kHz		-98			-98	
\hat{E}_s/N_{oc}	dB	0	-inf	4	7	-inf	7
RSRP Note 3	dBm/15 KHz	-98	-inf	-94	-91	-inf	-91
Propagation Condition		AWGN		AWGN			

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

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

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

Table A.8.21-4: Cell specific test parameters for E-UTRAN FDD-FDD inter frequency cell proximity detection test case (Cell 3)

Parameter	Unit	Cell 3		
		T1	T2	T3
E-UARFCN			Channel 1	
CSG indicator			False	
Physical cell global			3	
identity				
CSG identity			Not sent	
BW _{channel}	MHz		10	
OCNG Patterns			N/A	
defined in A.3.2.1.1				
(OP.1 FDD) and in				
A.3.2.1.2 (OP.2 FDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB		•	
PHICH_RB	dB		0	
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RBNote1	dB			
\hat{E}_s/I_{ot}	dB		-inf	
$N_{oc}^{ m Note 2}$	dBm/15 kHz		-98	
\hat{E}_s/N_{oc}	dB		-inf	
RSRP Note 3	dBm/15 KHz		-inf	
Propagation Condition			AWGN	

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

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as

AWGN of appropriate power for $\,N_{oc}\,$ to be fulfilled.

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

A.8.21.2 Test Requirements

The UE shall not send an "entering" proximity indication in T2 during Negative Test.

The UE shall send an "entering" proximity indication in T3 during Positive Test.

A.8.22 E-UTRAN Discovery Signal Measurements

A.8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

A.8.22.1.1 Test Purpose and Environment

The purpose of the test is to verify that the UE makes correct reporting of an event when discovery signal is configured in DRX. The test will partly verify the FDD-FDD intra-frequency cell search in DRX requirements in clause 8.6.2.1.1.

The test parameters are given in Tables A.8.22.1.1-1, A.8.22.1.1-2, A.8.22.1.1-3 and A.8.22.1.1-4. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.22.1.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.22.1.1-3
T1	S	5	
T2	S	10	

Table A.8.22.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1			Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		,	1		1	
Number						
BW _{channel}	MHz	1	0	10		
Measurement	n	13	-37	1	3-37	
bandwidth	$n_{{\scriptscriptstyle PRB}}$					
PDSCH parameters:		R.0	FDD		-	
DL Reference						
Measurement Channel						
PCFICH/PDCCH/PHIC		R.6	FDD	R.	6 FDD	
H parameters:						
DL Reference						
Measurement Channel						
OCNG Patterns						
defined in A.3.2.1.1		OP.1	FDD	OP	.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB	0		0		
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~2}$	dBm/15 KHz			-98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
\hat{E}_{s}/I_{ot}	dB	4	-1.46	-Infinity	-1.46	
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94	
lo Note 3	dBm/9MHz	-64.76	-62.42		columns for Cell 1	
Propagation Condition		ET	J30		TU30	
Correlation Matrix and			Low		2 Low	
Antenna Configuration						
Timing offset to Cell 1	μs		-	2.3	(CP/2)	
Note 1: OCNC shall be		the selle and fullu	-1141 1			

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

Note 3: Es/lot, RSRP and SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.22.1.1-3: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table A.8.22.1.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.22.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 4864ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

A.8.22.2.1 Test Purpose and Environment

The purpose of the test is to verify that the UE makes correct reporting of an event when discovery signal is configured in DRX. The test will partly verify the TDD-TDD intra-frequency cell search in DRX requirements in clause 8.6.2.1.1.

The test parameters are given in Tables A.8.22.2.1-1, A.8.22.2.1-2, A.8.22.2.1-3 and A.8.22.2.1-4. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.22.2.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	2	As specified in IE MeasDS-Config in TS 36.331
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.22.2.1-3
T1	S	5	
T2	s	10	

Table A.8.22.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		,			1	
Number						
BW _{channel}	MHz	1	0	10		
Measurement	$n_{{\scriptscriptstyle PRB}}$	13-	-37	1	3-37	
bandwidth	T PRB					
PDSCH parameters:		R.0	TDD		-	
DL Reference						
Measurement Channel						
PCFICH/PDCCH/PHIC		R.6	TDD	R.	6 TDD	
H parameters:						
DL Reference						
Measurement Channel						
OCNG Patterns						
defined in A.3.2.2.1		OP.1	TDD	OP	.2 TDD	
(OP.1 TDD) and in						
A.3.2.2.2 (OP.2 TDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB	0		0		
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N_{oc} Note 2	dBm/15 KHz			-98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
\hat{E}_s/I_{ot}	dB	4	-1.46	-Infinity	-1.46	
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94	
lo Note 3	dBm/9MHz	-64.76	-62.42	Specified in o	columns for Cell 1	
Propagation Condition			J30		TU30	
Correlation Matrix and			Low		2 Low	
Antenna Configuration		1/12 2011				
Timing offset to Cell 1	μs		=	2.3	(CP/2)	
Note 1: OCNC shall be		the selle sus feether	-11			

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

Note 3: Es/lot, RSRP and SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.22.2.1-3: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table A.8.22.2.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.22.2.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 4864ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

A.8.22.3.1 Test Purpose and Environment

The purpose of the test is to verify that the UE makes correct reporting of an event when discovery signal is configured in DRX. The test will partly verify the FDD-FDD inter-frequency measurement requirements in clause 8.6.2.2.1.

The test parameters are given in Tables A.8.22.3.1-1, A.8.22.3.1-2, A.8.22.3.1-3 and A.8.22.3.1-4. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. Entire discovery signal occasion should be contained in the measurement gap. The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.22.3.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
E-UTRA RF Channel		1, 2	Two FDD carrier frequencies are used.
Number			
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Gap Offset		9	As specified in TS 36.331 clause 6.3.5
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
PRACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent	No additional delays in random access procedure.
DRX		ON	DRX related parameters are defined in Table A.8.22.3.1-3
T1	S	5	
T2	S	10	

Table A.8.22.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		,	1		2	
Number						
BW _{channel}	MHz	1	0	10		
Measurement	n	13-	-37	1	13-37	
bandwidth	$n_{{\scriptscriptstyle PRB}}$					
PDSCH parameters:		R.0	FDD		-	
DL Reference						
Measurement Channel						
PCFICH/PDCCH/PHIC		R.6	FDD	R.	6 FDD	
H parameters:						
DL Reference						
Measurement Channel						
OCNG Patterns					<u> </u>	
defined in A.3.2.1.1		OP.1	FDD	OP	2.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB	0		0		
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N_{oc} Note 2	dBm/15 kHz			-98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7	
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
SCH RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
lo Note 3	dBm/9MHz	-64.76	-64.76	-70.22	-62.43	
Propagation Condition			J30		TU30	
Correlation Matrix and			Low		(2 Low	
Antenna Configuration		.,,,				
Timing offset to Cell 1	μs		-		3	
11.5 5.15 5.15	μο			1	- · · · · · · · · · · · · · · · · · · ·	

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

Note 3: Es/lot, RSRP and SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.22.3.1-3: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table A.8.22.3.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.22.3.2 Test Requirements

UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

A.8.22.4.1 Test Purpose and Environment

The purpose of the test is to verify that the UE makes correct reporting of an event when discovery signal is configured in DRX. The test will partly verify the FDD-FDD inter-frequency measurement requirements in clause 8.6.2.2.1.

The test parameters are given in Tables A.8.22.4.1-1, A.8.22.4.1-2, A.8.22.4.1-3 and A.8.22.4.1-4. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. Entire discovery signal occasion should be contained in the measurement gap. The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.22.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
E-UTRA RF Channel		1, 2	Two TDD carrier frequencies are used.
Number			
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Gap Offset		9	As specified in TS 36.331 clause 6.3.5
Uplink-downlink		1	As specified in table 4.2-2 in TS 36.211.
configuration			The same configuration in both cells
Special subframe		6	As specified in table 4.2-1 in TS 36.211.
configuration			The same configuration in both cells
DMTC period	ms	160	As specified in IE MeasDS-Config in TS
			36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS
			36.331
Discovery signal occasion	ms	2	As specified in IE MeasDS-Config in TS
duration			36.331
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
PRACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent	No additional delays in random access
			procedure.
DRX		ON	DRX related parameters are defined in
			Table A.8.22.4.1-3
T1	S	5	
T2	S	10	

Table A.8.22.4.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		ell 1 Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1			2	
Number						
BW _{channel}	MHz	10		10		
Measurement	n_{PRB}	13-	37	13	3-37	
bandwidth	"PRB					
PDSCH parameters:		R.0 ⁻	ΓDD		-	
DL Reference						
Measurement Channel						
PCFICH/PDCCH/PHIC		R.6	ΓDD	R.6	TDD	
H parameters:						
DL Reference						
Measurement Channel						
OCNG Patterns						
defined in A.3.2.2.1		OP.1	TDD	OP.2	2 TDD	
(OP.1 TDD) and in						
A.3.2.2.2 (OP.2 TDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB	0		0		
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH RB	dB					
OCNG_RA ^{Note 1}	dB	1				
OCNG_RB ^{Note 1}	dB					
N_{oc} Note 2	dBm/15 kHz			-98		
				1.6.4		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
Ĉ/I	dB	4	4	-Infinity	7	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$				-		
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
lo Note 3	dBm/9MHz	-64.76	-64.76	-70.22	-62.43	
Propagation Condition		ETU	J30	ET	U30	
Correlation Matrix and		1x2	Low	1x2	Low	
Antenna Configuration						
Timing offset to Cell 1	μs	-		3 (Synchro	onous cells)	
Note 1: OCNG shall be	•	th colle are fully	allocated and a		•	

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

Note 3: Es/lot, RSRP and SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.22.4.1-3: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table A.8.22.4.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.22.4.2 Test Requirements

UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

A.8.22.5.1 Test Purpose and Environment

The purpose of the test is to verify that the UE makes correct reporting of an event in DRX. The test will partly verify the FDD-FDD intra-frequency cell search in DRX requirements in clause 8.6.3.1.1.2.

The test parameters are given in Tables A.8.22.5.1-1, A.8.22.5.1-2, A.8.22.5.1-3 and A.8.22.5.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

The UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.22.5.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Value	Comment
		Test 1	
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
DMTC period [2]	ms	160	
DMTC period offset [2]	ms	10	
Discovery signal occasion duration	ms	1	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.22.5.1-3
Time offset between cells		2.3 μs	CP/2 or Synchronous cells
T1	S	5	
T2	S	10	

Table A.8.22.5.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Ce	Cell 1 Cell 2		Cell 2
		T1	T2	T1	T2
E-UTRA RF Channel		1			1
Number					
BW _{channel}	MHz	10			10
Measurement	n _{PRB}	13-37			13-37
bandwidth					
PDSCH parameters		DL Reference	Measurement	DL Referen	ce Measurement
			0 FDD as in	Channel	R.0 FDD as in
		A.3.			3.1.1.1
PCFICH/PDCCH/PHIC			Measurement		ce Measurement
H parameters			6 FDD as in		R.6 FDD as in
		A.3.			3.1.2.1
Correlation Matrix and		1x2	Low	1:	k2 Low
Antenna Configuration					
OCNG Patterns					
defined in A.3.2.1.1		OP.1	FDD	OF	P.2 FDD
(OP.1 FDD) and in					
A.3.2.1.2 (OP.2 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB		,	0	
PHICH_RA	dB	()		
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
p-C-r10 [2]	dB	6	6	6	6
N_{oc} Note 3	dBm/15 KHz	-98		98	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4
CRS $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46
CSI-RS $\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	10	4.54	-Infinity	4.54
RSRP Note 4	dD /4 = 1/11	0.4	0.4	In Contractor	0.4
Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
CSI-RSRP Note 4 SCH_RP Note 4	dBm/15 KHz	-88	-88	-Infinity	-88
	dBm/15 KHz	-94	-94	-Infinity	-94
001 = form = size = 1	dBm/9 MHz	-60	-60	Specied in (columns for cell1
CSI reference signal		-	2		4
configurations [16]			2		
CSI-RS subframe		(0		0
offset	40	,	<u> </u>		0
CSI-RS individual	dB	0			0
offset [2]	1	F	abla	-	-nahla
CSI-RS muting			able		Enable
Propagation Condition	120	ETU30 ETU30 - 2.3 (CP/2)			
Timing offset to cell 1 Note 1: OCNG shall be	US Lead such that	t both colla ara f	ully allocated as		

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.22.5.1-3: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table A.8.22.5.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.22.5.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5632ms ($T_{identify_intra_SCE_DRX} + T_{Measurement_Period_intra_FDD_CSI-RS_DRX} = 16* max { <math>T_{DMTC_periodicity}$, DRX cycle length} + $3*Max\{T_{DMTC_periodicity}$, DRX cycle length} + $3*Max\{T_{DMTC_periodicity}$, DRX cycle length} = $22*Max\{T_{DMTC_periodicity}$, DRX cycle length}) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

A.8.22.6.1 Test Purpose and Environment

The purpose of the test is to verify that the UE makes correct reporting of an event in DRX. The test will partly verify the TDD-TDD intra-frequency cell search in DRX requirements in clause 8.6.3.1.2.2.

The test parameters are given in Tables A.8.22.6.1-1, A.8.22.6.1-2, A.8.22.6.1-3 and A.8.22.6.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.22.6.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Value	Comment
		Test 1	
PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.2
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2
parameters		Channel R.6 TDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
DMTC period [2]	ms	160	
DMTC period offset [2]	ms	10	
Discovery signal occasion	ms	2	
duratuion			
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
			The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211.
			The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in
			Table A.8.22.6.1-3
T1	S	5	
T2	S	10	

Table A.8.22.6.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Ce	II 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		,	1		1	
Number	NAL I—	4	0		40	
BW _{channel}	MHz		10 10 13-37 13-37			
Measurement	n _{PRB}	13	-37	13-37		
bandwidth		DI Deference	Magauramant	DI Deferen	aa Maaauramant	
DDCCII maramatara		DL Reference Measurement			ce Measurement	
PDSCH parameters			Channel R.0 TDD as in Channel R.0 TDD			
			1.1.2 Measurement		3.1.1.2 ce Measurement	
DCEICH/DDCCH/DHIC						
PCFICH/PDCCH/PHIC			6 TDD as in		R.6 TDD as in	
H parameters			1.2.2		3.1.2.2	
Correlation Matrix and		1X2	Low	1)	k2 Low	
Antenna Configuration						
OCNG Patterns		00.4	TDD	0.5	O TOD	
defined in A.3.2.1.1		OP.1	TDD	OF	P.2 TDD	
(OP.1 TDD) and in						
A.3.2.1.2 (OP.2 TDD)	ID.					
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB		2			
PHICH_RA	dB	(0		0	
PHICH_PB	dB					
PDCCH_RA	dB					
PDCCH_PB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
p-C-r10 [2]	dB	6	6	6	6	
N_{oc} Note 3	dBm/15 KHz	-9		-98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
1	4D	4	4.40	In the ite.	4.40	
CRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	4	-1.46	-Infinity	-1.46	
CSI-RS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	10	4.54	-Infinity	4.54	
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
CSI-RSRP Note 4	dBm/15 KHz	-88	-88	-Infinity	-88	
lo	dBm/9 MHz	-60	-57		columns for cell1	
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition	. <u> </u>			TU30	- - -	
CSI reference signal			2		4	
configurations [16]		· ·	-		•	
CSI-RS subframe		0			0	
offset		U			•	
CSI-RS individual	dB	0			0	
offset [2]				-		
CSI-RS muting		Fnahla		Enable Enable		nable
Timing offset to cell 1	us		0		3 (CP/2)	
Note 1: OCNG shall b						

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.22.6.1-3: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table A.8.22.6.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
TimeAlignmentTimer	ofFOO	As specified in clause 6.3.2 in TS
TimeAlignmentTimer	sf500	36.331
		For further information see
sr-ConfigIndex	0	clause 6.3.2 in TS 36.331 and
		section10.1 in TS 36.213.

A.8.22.6.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5632 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.22.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

A.8.22.7.1 Test Purpose and Environment

The purpose of the test is to verify that the UE makes correct reporting of an event in DRX. The test will partly verify the FDD-FDD inter-frequency cell search in DRX requirements in clause 8.6.3.2.1.2.

The test parameters are given in Tables A.8.22.7.1-1, A.8.22.7.1-2, A.8.22.7.1-3 and A.8.22.7.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

The UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.22.7.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Value	Comment
		Test 1	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel		1,2	Two FDD carrier frequency is used.
Number			
DMTC period [2]	ms	160	
DMTC period offset [2]	ms	10	
Discovery signal occasion	ms	1	
duration			
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in
			Table A.8.22.7.1-3
T1	S	5	
T2	S	10	

Table A.8.22.7.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Ce	II 1		Cell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel		,			2		
Number	NAL I—	4	0	10			
BW _{channel}	MHz		0		10		
Measurement	n _{PRB}	13	-37	· ·	13-37		
bandwidth		DI Deference	Magauramant	DI Deferen	as Massurament		
PDSCH parameters			Measurement		ce Measurement		
			0 FDD as in		R.0 FDD as in		
PCFICH/PDCCH/PHIC		A.3.			3.1.1.1		
			Measurement		ce Measurement		
H parameters			6 FDD as in		R.6 FDD as in		
Correlation Matrix and			1.2.1 Low		3.1.2.1 x2 Low		
Antenna Configuration		IXZ	LOW	12	XZ LUW		
OCNG Patterns							
defined in A.3.2.1.1		OP 1	FDD	0	P.2 FDD		
(OP.1 FDD) and in		OF.1	רטט	l Or	2		
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
	dB			0			
SSS_RA PCFICH_RB	dB						
		()				
PHICH_RA PHICH_PB	dB	·			ŭ		
_	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
p-C-r10 [2]	dB	6	6	6	6		
$N_{oc}^{ m Note~3}$	dBm/15 KHz			·98			
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4		
CRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	4	-1.46	-Infinity	-1.46		
	dB	10	4.54	-Infinity	4.54		
CSI-RS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$							
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94		
CSI-RSRP Note 4	dBm/15 KHz	-88	-88	-Infinity	-88		
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94		
lo	dBm/9 MHz	-60	-60		ified for cell 1		
Propagation Condition			E1	U30			
CSI reference signal			2		4		
configurations [16]							
CSI-RS subframe			0		0		
offset							
CSI-RS individual	dB		0		0		
offset [2]							
CSI-RS muting		Ena	able	E	nable		
Timing offset to cell 1	us		-		3us		
	a used such that	thetheelleeut	مرم المحمد ما المرابا	-1			

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.22.7.1-3: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table A.8.22.7.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment			
TimeAlignmentTimer	sf500	For further information see			
TimeAlignmentTimer	\$1500	clause 6.3.2 in TS 36.331.			
		For further information see			
sr-ConfigIndex	0	clause 6.3.2 in TS 36.331 and			
_		section10.1 in TS 36.213			

A.8.22.7.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5888ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report

A.8.22.8 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal

A.8.22.8.1 Test Purpose and Environment

The purpose of the test is to verify that the UE makes correct reporting of an event in DRX. The test will partly verify the TDD-TDD inter-frequency cell search in DRX requirements in clause 8.6.3.2.2.2.

The test parameters are given in Tables A.8.22.8.1-1, A.8.22.8.1-2, A.8.22.8.1-3 and A.8.22.8.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

The UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.22.8.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit Test 1		Comment			
		Value				
E-UTRA RF Channel		1, 2	Two TDD carrier frequencies are used.			
Number						
Channel Bandwidth	MHz	10				
(BW _{channel})						
Active cell		Cell 1	Cell 1 is on RF channel number 1			
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2			
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.			
Uplink-downlink		1	As specified in TS 36.211 clause 4.2 Table			
configuration			4.2-2			
Special subframe		6	As specified in table 4.2-1 in TS 36.211.			
configuration			The same configuration in both cells			
DMTC period [2]	ms	160				
DMTC period offset [2]	ms	10				
Discovery signal occasion	ms	2				
duration						
A3-Offset	dB	-6				
Hysteresis	dB	0				
CP length		Normal				
TimeToTrigger	S	0				
Filter coefficient		0	L3 filtering is not used			
PRACH configuration		4	As specified in table 5.7.1-3 in TS 36.211			
Access Barring Information	-	Not Sent	No additional delays in random access			
			procedure.			
DRX		ON	DRX related parameters are defined in			
			Table A.8.22.8.1-3			
T1	S	5				
T2	S	10				

Table A.8.22.8.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Ce	II 1		Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		1			2	
Number						
BW _{channel}	MHz		0	10		
Measurement	n _{PRB}	13-	-37		13-37	
bandwidth						
PDSCH parameters			Measurement		ce Measurement	
		Channel R.0			R.0 TDD as in	
DOELOU / DD COU / DU U C		A.3.1			.3.1.1.2	
PCFICH/PDCCH/PHIC			Measurement		ce Measurement	
H parameters		Channel R.			R.6 TDD as in	
Onwalation Matrix and		A.3.1			3.1.2.2.	
Correlation Matrix and		1x2	LOW	13	x2 Low	
Antenna Configuration OCNG Patterns						
defined in A.3.2.1.1		OD 1	TDD	0.0	O TOD	
(OP.1 TDD) and in		OP.1	טטו	OF	P.2 TDD	
A.3.2.1.2 (OP.2 TDD)						
PBCH_RA	dB					
PBCH_RB	dB	-				
PSS_RA	dB	-				
SSS_RA	dB	-		0		
PCFICH_RB	dB	-				
PHICH_RA	dB)			
PHICH_PB	dB dB					
PDCCH_RA	dB	-				
PDCCH_PB	dB	-				
PDSCH_RA	dB	-				
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB	-				
p-C-r10 [2]	dB	6	6	6	6	
	dBm/15 KHz			-98		
$N_{oc}^{ m Note~3}$						
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
	dB	4	-1.46	-Infinity	-1.46	
CRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	ų d	·	1.10		0	
CSI-RS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	10	4.54	-Infinity	4.54	
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
CSI-RSRP Note 4	dBm/15 KHz	-88	-88	-Infinity	-88	
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
lo	dBm/9 MHz	-60	-60		ificed for cell1	
Propagation Condition	3511,0 1411 12	50		U30		
CSI reference signal			2		4	
configurations [16]		_			·	
CSI-RS subframe		()		0	
offset		`	-		<u> </u>	
CSI-RS individual	dB	()		0	
offset [2]						
CSI-RS muting		Ena	able	i	Enable	
Timing offset to cell 1	us		-		3	
		t both cells are fu	ully allocated an	d a constant to	otal transmitted	

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.22.8.1-3: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table A.8.22.8.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment			
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331			
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.			

A.8.22.8.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5888ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

A.8.22.9.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] when CRS based discovery signal is configured within the requirements stated in clause 8.7.2.4.1.

The test parameters are given in Tables A.8.22.9.1-1 and A.8.22.9.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

Table A.8.22.9.1-1: General test parameters for E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

	Parameter	Unit	Value	Comment			
E-UT	RA RF Channel		1, 2	Two radio channels are used for this test			
Num	ber		·				
Activ	e PCell		Cell 1	Primary cell on RF channel number 1.			
Configured deactivated			Cell 2	Configured deactivated secondary cell on			
SCel			Oeli Z	RF channel number 2.			
Neighbour cell CP length			Cell 3	Neighbor cell to be identified on RF channel number 2.			
CP le	ength		Normal				
DRX			OFF	Continuous monitoring of primary cell			
DMT	C period	ms	160	As specified in IE MeasDS-Config in TS 36.331			
dmtc and 3	-PeriodOffset for cells 2	ms	10	As specified in IE MeasDS-Config in TS 36.331			
Disco	overy signal occasion ion	ms	1	As specified in IE MeasDS-Config in TS 36.331			
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.			
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerand in clause 9.1.14.2 into account plus margin.			
	Time To Trigger	S	0				
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.			
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.14.2 into account plus margin.			
	Report on leave		False				
	Time To Trigger	S	0				
	ndividual offset for cells F channel number 1	dB	0	Individual offset for cells on primary component carrier.			
	ndividual offset for cells F channel number 2	dB	0	Individual offset for cells on secondary component carrier.			
	Filter coefficient		0	L3 filtering is not used			
SCel	I measurement cycle sCycleSCell)	ms	320	y			
T1	, /	s	10				
T2		S	10				
T3		S	5				
NOT		DDM					

NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.22.9.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter	Unit		Cell 1			Cell 2		Cell 3		
		T1	T2	T3	T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel			1			2			2	
Number										
BW _{channel}	MHz		10		10			10		
Measurement	n		13-37		13-37				13-37	
bandwidth	n_{PRB}				13-37				10 07	
PDSCH parameters:			R.0 FDD		-				-	
DL Reference										
Measurement Channel								_		
PCFICH/PDCCH/PHIC			R.6 FDD			R.6 FDD		h	R.6 FDD	
H parameters:										
DL Reference										
Measurement Channel										
OCNG Patterns		,	2D 4 EDD		l ,	0D 0 EDD			D 0 EDD	
defined in A.3.2.1.1		,	OP.1 FDD		'	OP.2 FDD		١	P.2 FDD	
(OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)										
PBCH_RA	dB									
PBCH_RB	dB dB									
PSS_RA	dB				0			0		
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB		0							
PDCCH_RA	dB		U		ľ					
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA ^{Note 1}	dB									
OCNG PRNote 1	dB									
N _{oc} Note 2	dBm/15 kHz		-101				-10	l)1		
Ê _s /N _{oc}	dBIII/13 KI12	19	19	-3	19	19	-3	-infinity	19	-3
Ê _s /I _{ot}	dB	19	19	-3	19	-0.05	-4.76	-infinity	-0.05	-4.76
RSRP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104
SCH_RP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104
lo Note 3	dBm/9MHz	-54.16	-54.16	-10-	-54.16	-51.18	-10-		d in colur	
10	dDiff/3ivii iz	-34.10	-5-10	71.45			70.20	Opecine	Cell 2	11113 101
Propagation Condition		ETU30		ETU30				ETU30		
Correlation Matrix and			1x2 Low			1x2 Low			1x2 Low	
Antenna Configuration		TAZ LUW			.AZ LOW					
Timing offset to Cell 1	μs	_			0				-	
Time alignment error	μs		_		U ≤ TAE				N/A	
relative to cell 1 Note 5	μδ		_			- 1/1				
Timing offset to Cell 2	μs		-			-			.3 (CP/2)	
Note 1: OCNG shall b	e used such that	t all cells a	re fully allo	cated and	d a constar	nt total tran	smitted p	ower spect	tral densi	tv is

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

A.8.22.9.2 Test Requirements

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 5.12s $(13 \times measCycleSCell + T_{measure_scc_CRS})$ from the beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 480 ($3 \times T_{DMTC_periodicity}$) ms from beginning of time T3.

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

Note 3: Es/lot, RSRP and SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 960ms (3× measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

A.8.22.10.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] when CRS based discovery signal is configured within the requirements stated in clause 8.7.2.4.1.

The test parameters are given in Tables A.8.22.10.1-1 and A.8.22.10.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

Table A.8.22.10.1-1: General test parameters for E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

	Parameter	Unit	Value	Comment
E-U7	RA RF Channel		1, 2	Two radio channels are used for this test
Num	ber		•	
Activ	e PCell		Cell 1	Primary cell on RF channel number 1.
Conf	igured deactivated		Cell 2	Configured deactivated secondary cell on
SCe			Cell 2	RF channel number 2.
Neig	hbour cell		Cell 3	Neighbor cell to be identified on RF
			Cell 3	channel number 2.
	ength		Normal	
	cial subframe		6	As specified in table 4.2.1 in TS 36.211.
	guration		6	The same configuration applies to all cells.
Uplir	k-downlink		1	
	guration		·	
DRX			OFF	Continuous monitoring of primary cell
DMT	C period	ms	160	As specified in IE MeasDS-Config in TS
				36.331
	-PeriodOffset for cells 2	ms	10	As specified in IE MeasDS-Config in TS
and				36.331
	overy signal occasion	ms	2	As specified in IE MeasDS-Config in TS
dura				36.331
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm		Actual RSRP threshold for event A2.
			-93	Needs to take absolute accuracy tolerance
			-93	in clause 9.1.14.2 into account plus
				margin.
	Time To Trigger	S	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB		Offset parameter for evaluation of event
			-6	A6. Needs to take relative accuracy
			9	tolerance in clause 9.1.14.2 into account
				plus margin.
	Report on leave		False	
	Time To Trigger	S	0	
	individual offset for cells	dB	0	Individual offset for cells on primary
	F channel number 1			component carrier.
	individual offset for cells	dB	0	Individual offset for cells on secondary
	F channel number 2			component carrier.
	coefficient		0	L3 filtering is not used
	I measurement cycle	ms	320	
	sCycleSCell)			
T1		S	10	
T2		S	10	
T3		S	5	

NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.22.10.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter	Unit		Cell 1			Cell 2		Cell 3		
		T1	T2	T3	T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel			1			2			2	
Number										
BW _{channel}	MHz		10		10			10		
Measurement	n		13-37		13-37				13-37	
bandwidth	n_{PRB}				13-37				10 07	
PDSCH parameters:			R.0 TDD		-				-	
DL Reference										
Measurement Channel								_		
PCFICH/PDCCH/PHIC			R.6 TDD			R.6 TDD		h	R.6 TDD	
H parameters:										
DL Reference										
Measurement Channel										
OCNG Patterns		,	2D 4 TDD		,				D 0 TDD	
defined in A.3.2.2.1		,	OP.1 TDD			OP.2 TDD		١	P.2 TDD	
(OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)										
PBCH_RA	dB									
PBCH_RB	dB dB									
PSS_RA	dB				0			0		
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB		0							
PDCCH_RA	dB		U		l °				U	
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA ^{Note 1}	dB									
OCNG PRNote 1	dB									
N _{oc} Note 2	dBm/15 kHz		-101				-10	l)1		
Ê _s /N _{oc}	dBiii/10 Ki i2	19	19	-3	19	19	-3	-infinity	19	-3
Ê _s /I _{ot}	dB	19	19	-3	19	-0.05	-4.76	-infinity	-0.05	-4.76
RSRP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104
SCH_RP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104
lo Note 3	dBm/9MHz	-54.16	-54.16	-10-	-54.16	-51.18	-10-		d in colur	
10	dDiff/3ivii iz	-34.10	-54.10	71.45			70.20	Ореспіс	Cell 2	11113 101
Propagation Condition		ETU30		ETU30				ETU30		
Correlation Matrix and			1x2 Low			1x2 Low			1x2 Low	
Antenna Configuration			.AL LOW			.AZ LUW				
Timing offset to Cell 1	μs	_			0				-	
Time alignment error	μs		_		U ≤ TAE				N/A	
relative to cell 1 Note 5	μδ					= 1/1L				
Timing offset to Cell 2	μs		-			-			.3 (CP/2)	
Note 1: OCNG shall b	e used such that	t all cells a	re fully allo	cated and	d a constar	nt total tran	smitted p	ower spect	tral densi	tv is

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

A.8.22.10.2 Test Requirements

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 5.12s $(13 \times measCycleSCell + T_{measure_scc_CRS})$ from the beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 480 ($3 \times T_{DMTC_periodicity}$) ms from beginning of time T3.

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

Note 3: Es/lot, RSRP and SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 960ms (3× measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.22.11 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal

A.8.22.11.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.7.3.4.1.

The test parameters are given in Tables A.8.22.11.1-1 and A.8.22.11.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

Table A.8.22.11.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter		Unit	Value	Comment					
E-UTRA RF Channel			1 0	Two radio channels are used for this test					
Number			1, 2						
Active PCell			Cell 1	Primary cell on RF channel number 1.					
Conf	Configured deactivated		Cell 2	Configured deactivated secondary cell on					
SCe			Cell 2	RF channel number 2.					
Neig	Neighbour cell		Cell 3	Neighbor cell to be identified on RF					
			Oeii 3	channel number 2.					
DMT	DMTC period		160	As specified in IE MeasDS-Config in TS					
				36.331					
	-PeriodOffset for cells 2	ms	10	As specified in IE MeasDS-Config in TS					
and				36.331					
	overy signal occasion	ms 1		As specified in IE MeasDS-Config in TS					
dura				36.331					
	ength		Normal						
DRX			OFF	Continuous monitoring of primary cell					
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.					
	Threshold RSRP	dBm		Actual RSRP threshold for event A2.					
	-93	-93	Needs to take absolute accuracy tolerance						
			00	in clause 9.1.11.1 into account plus					
				margin.					
	Time To Trigger	S	0						
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.					
	Offset	dB	-6	Offset parameter for evaluation of event					
				A6. Needs to take relative accuracy					
				tolerance in clause 9.1.11.2 into account					
				plus margin.					
	Report on leave		False						
	Time To Trigger	s dB	0						
	Cell-individual offset for cells		0	Individual offset for cells on primary					
	on RF channel number 1			component carrier.					
	Cell-individual offset for cells		0	Individual offset for cells on secondary					
	on RF channel number 2			component carrier.					
	Filter coefficient		0	L3 filtering is not used					
	SCell measurement cycle		320						
	(measCycleSCell)								
T1	T1		10						
T2			10						
T3	T3		5						

NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.22.11.1-2: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter	Unit	Cell 1			Cell 2			Cell 3			
		T1	T2	Т3	T1	T2	Т3	T1	T2	Т3	
E-UTRA RF Channel Number		1			2			2			
BW _{channel}	MHz	10			10			10			
Measurement	n _{PRB}	13-37		10 13-37				13-37			
bandwidth	HPRB	13-37		15-3/			13-31				
PDSCH parameters		DI	L Referenc		DI	DL Reference			Reference	<u></u>	
1 Door parameters			ment Char			ment Chan			Measurement Channel		
		FDD as in A.3.1.1.1			FDD as in A.3.1.1.1			R.0 FDD as in A.3.1.1.1			
PCFICH/PDCCH/PHIC			L Referenc		DL Reference			DL Reference			
H parameters		Measurement Channel R.6			Measurement Channel R.6			Measurement Channel			
•		FDD as in A.3.1.2.1		FDD as in A.3.1.2.1			R.6 FDD as in A.3.1.2.1				
Correlation Matrix and			1x2 Low		1x2 Low			1x2 Low			
Antenna Configuration											
OCNG Patterns											
defined in A.3.2.1.1		OP.1 FDD			OP.2 FDD			OP.2 FDD			
(OP.1 FDD) and in											
A.3.2.1.2 (OP.2 FDD)											
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB				!						
PCFICH_RB	dB										
PHICH_RA	dB								_		
PHICH_RB	dB	0		0			0				
PDCCH_RA	dB										
	PDCCH_RB dB										
PDSCH_RA	dB										
PDSCH_RB	dB			!							
OCNG_RA ^{Note 1}	dB										
OCNG_RB ^{Note 1}	dB		101		10						
Noc Note 2	dBm/15 kHz		-101	101			-10			404	
RSRP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104	
CSI-RSRP Note 3 SCH_RP Note 3	dBm/15 kHz	-76	-76	-98	-76	-76	-98	-infinity	-76	-98	
	dBm/15 kHz	-82 19	-82 19	-104	-82	-82	-104	-infinity	-82	-104	
\hat{E}_s/N_{oc} CRS \hat{E}_s/I_{ot}	dB	19	19	-3 -3	19	19	-3 -4.76	-infinity	19	-3	
CSI-RS Ê _s /I _{ot}	dB dB			3	19	-0.05	1.24	-infinity	-0.05	-4.76	
CSI-RS resource	uБ	25 25 3 2		25 5.95 1.24 4		-infinity 5.95 1.24					
configurations [16]			2			4			O		
p-C-r10 [2]	dB	6		6			6				
CSI-RS subframe	ų D	0			0			0			
offset								J			
CSI-RS individual	[dB]	0		0			0				
offset [2]								Ĭ			
CSI-RS muting		Enable			Enable			Enable			
Propagation Condition		ETU30		ETU30			ETU30				
Time offset to cell 1	us	0			0			2.3 (CP/2)			
Time alignment error	us	-				≤ TAE			N/A		
relative to cell1 Note 5											
Note 1: OCNG shall b	e used such that	t all cells a	re fully allo	cated an	d a constar	nt total tran	smitted n	ower spec	tral densi	tv is	

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

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

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.8.22.11.2 Test Requirements

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6.08s $(T_{identify_scc_SCE} + T_{measure_scc_CSI-RS} = 13*measCycleSCell + T_{measure_scc_CSI-RS} = 13*measCycleSCell + 3*measCycleSCell)$ from the beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 480 ms $(3*T_{DMTC_periodicity})$ from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 960ms (3× measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.22.12 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal

A.8.22.12.1 Test Purpose and Environment

The purpose of this test is to verify that the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.7.3.4.1.

The test parameters are given in Tables A.8.22.12.1-1 and A.8.22.12.1-2 below. It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

Table A.8.22.12.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

	Parameter	Unit	Value	Comment					
E-UTRA RF Channel			1, 2	Two radio channels are used for this test					
Number									
Active PCell			Cell 1	Primary cell on RF channel number 1.					
Configured deactivated			Cell 2	Configured deactivated secondary cell on					
	SCell		Gell 2	RF channel number 2.					
Neigh	nbour cell		Cell 3	Neighbor cell to be identified on RF					
		ms		channel number 2.					
	DMTC period		160	As specified in IE MeasDS-Config in TS 36.331					
and 3		ms	10	As specified in IE MeasDS-Config in TS 36.331					
Disco	overy signal occasion ion	ms	1	As specified in IE MeasDS-Config in TS 36.331					
Chan	nel Bandwidth	MHz	40	Channel bandwidth for cells on primary					
(BW _c	hannel)		10	and secondary component carriers					
CP le			Normal						
Spec	ial subframe		6	As specified in table 4.2.1 in TS 36.211.					
confi	guration		0	The same configuration applies to all cells.					
	k-downlink		1						
	guration		•						
DRX			OFF	Continuous monitoring of primary cell					
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.					
	Threshold RSRP	dBm		Actual RSRP threshold for event A2.					
			-93	Needs to take absolute accuracy tolerance					
			33	in clause 9.1.11.1 into account plus					
				margin.					
	Time To Trigger	S	0						
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.					
	Offset	dB		Offset parameter for evaluation of event					
			-6	A6. Needs to take relative accuracy					
				tolerance in clause 9.1.11.2 into account					
				plus margin.					
	Report on leave		False						
	Time To Trigger	S	0						
	ndividual offset for cells	dB	0	Individual offset for cells on primary					
	F channel number 1	in.	<u>-</u>	component carrier.					
	ndividual offset for cells	dB	0	Individual offset for cells on secondary					
on RF channel number 2				component carrier.					
Filter coefficient			0	L3 filtering is not used					
SCell measurement cycle		ms	320						
(measCycleSCell)		_		Desire which there the LIE shall be					
T1		S	5	During this time the UE shall be aware of					
T2				cells 1 and 2 but not cell 3. UE should report Event A6 within 6.08s					
12		S	≤12						
T3		S		(19xscellMeasCycle) UE should report Event A2 within 200 ms					
13		5	5	and 960s for cells 1 and 2, respectively.					
NOTI	This tost verifies the	DDM roo	wirement which is independen	t of channel bandwidth and is performed according					

NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.22.12.1-2: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter	Unit		Cell 1		Cell 2			Cell 3			
		T1	T2	Т3	T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1			2			2		
Number					2			2			
BW _{channel}	MHz	10		10				10			
Measurement	n _{PRB}	13-37		13-37			13-37				
bandwidth											
PDSCH parameters			L Reference			Reference		DL Reference			
		Measurement Channel R.0			Measurement Channel R.0			Measurement Channel			
DOEIGI I/DDOGI I/DI IIG			As in A.3.1		TDD As in A.3.1.1.2			R.0 TDD As in A.3.1.1.2 DL Reference			
PCFICH/PDCCH/PHIC		_	L Reference	-	DL Reference						
H parameters		Measurement Channel R.6 TDD as in A.3.1.2.2		Measurement Channel R.6			Measurement Channel R.6 TDD as in A.3.1.2.2				
Correlation Matrix and		100	1x2 Low	.∠.∠	TDD as in A.3.1.2.2 1x2 Low			1x2 Low			
Antenna Configuration			IXZ LOW		IXZ LOW			IAZ LUW			
OCNG Patterns											
defined in A.3.2.1.1		OP.1 TDD			OP.2 TDD			OP.2 TDD			
(OP.1 TDD) and in											
A.3.2.1.2 (OP.2 TDD)											
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB	1									
PHICH_RB	dB	0			0		0				
PDCCH_RA	dB	7									
PDCCH_RB	dB										
PDSCH_RA	dB]									
PDSCH_RB	dB]									
OCNG_RA ^{Note 1}	dB										
OCNG_RB ^{Note 1}	dB										
Noc Note 2	dBm/15 kHz		-101	ı	-10						
RSRP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104	
SCH_RP Note 3	dBm/15 kHz	-82	-82	-104	-82	-82	-104	-infinity	-82	-104	
Ê _s /N _{oc}	dB	19	19	-3	19	19	-3	-infinity	19	-3	
CRS Ê _s /I _{ot}	dB	19	19	-3	19	-0.05	-4.76	-infinity	-0.05	-4.76	
CSI-RS Ê _s /I _{ot}	dB	25 25 3			25 5.95 1.24			-infinity 5.95 1.24			
Propagation Condition					I	ETU70		1			
CSI-RS resource			0			2			4		
configurations [16]					0			0			
CSI-RS subframe		0			0			0			
offset CSI-RS individual	[dB]	0			0		0				
offset [2]	[ub]	U			U						
CSI-RS muting		Enable		Enable			Enable				
p-C-r10 [2]	dB	Enable 6		6			6				
Time offset to cell 1			0			0			2.3 (CP/2)		
Time alignment error	us	-			≤ TAE			N/A			
relative to cell1 Note 5	45					- 1/1			14//1		
	e used such that	t all cells a	re fully allo	cated an	d a constar	nt total tran	smitted n	ower spec	tral densi	ity is	

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

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

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of

carrier aggregation.

A.8.22.12.2 Test Requirements

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6.08s $(T_{identify_scc_SCE} + T_{measure_scc_CSI-RS} = 13*measCycleSCell + T_{measure_scc_CRS} + T_{measure_scc_CSI-RS} = 13*measCycleSCell + 3*measCycleSCell)$ from the beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 480 ms $(3*T_{DMTC_periodicity})$ from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 960ms (3× measCycleSCell) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events.

NOTE: The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.23 E-UTRAN Dual Connectivity Measurements

A.8.23.1 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

A.8.23.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of intra frequency measurement. This test will partly verify the FDD intra-frequency cell search requirements in clause 8.8.2 and 8.8.3.

The test parameters are given in Table A.8.23.1.1-1, A.8.23.1.1-2, A.8.23.1.1-3 and A.8.23.1.1-4 below. In the test there are two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. In the measurement control information it is indicated to the UE that event-triggered reporting with Events A1 (PCell and PSCell) and A2 (PCell and PSCell) is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Prior to the start of the time duration T1, DRX configurations on MCG and SCG are enabled and DRX inactivity timers for MCG and SCG have already been expired. Immediately at beginning of T2 the transmission powers of Cell1 and Cell2 are reduced below a threshold value of event A2 and this shall result in reporting of Event A2 for PCell and PSCell, respectively. Immediately after receiving the reporting of event A2 for both PCell and PSCell, PDCCH indicating a new transmission on Cell1 shall be sent continuously to ensure that the UE would not enter the DRX state on MCG throughout T3. At beginning of T3 the transmission powers of Cell1 and Cell2 are increased above a threshold value of event A1 and this shall result in reporting of Event A1 for PCell and PSCell, respectively.

When MCG DRX is used, the uplink time alignment of Cell1 is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting in Cell1. When SCG DRX is used, the UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment in Cell2. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.23.1.1-1: General test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

	Parameter	Unit	Value	Comment
	E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test.
Active	PCell		Cell1	PCell on RF channel number 1.
Config	ured PSCell		Cell2	PSCell on RF channel number 2.
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP		-95	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	S	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-99	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	S	0	
CP len			Normal	
DRX			ON	DRX related parameters are defined in Table A.8.23.1.1-3
cells or	Cell-individual offset for cells on RF channel number 1		0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Filter coefficient			0	L3 filtering is not used
T1		S	2	
T2		S	10	
T3		S	1	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 2: A UE capable of both synchronous and asynchronous DC operations is not required to pass this test case in accordance with the principle defined in section A.3.6.11.

Table A.8.23.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1			2	
Number							
BW _{channel}	MHz		$MHz: N_{RB,c} =$			$MHz: N_{RB,c} =$	
		$10MHz: N_{RB,c} = 50$				MHz: $N_{RB,c} =$	
			$MHz: N_{RB,c} =$			$MHz: N_{RB,c} =$	
PDSCH parameters:			MHz: R.5 FD			MHz: R.5 FD	
DL Reference			OMHz: R.0 FI			OMHz: R.0 FI	
Measurement Channel		20	MHz: R.4 F	טט	20	OMHz: R.4 F	טט
PCFICH/PDCCH/PHICH		51	MHz: R.11 F	DD	51	MHz: R.11 F	DD
parameters:		10	MHz: R.6 F	DD	10	MHz: R.6 F	DD
DL Reference		20	MHz: R.10 F	DD	20	MHz: R.10 F	DD
Measurement Channel OCNG Patterns		EN.	1Hz: OP.15 F	DD	EN.	1Hz: OP.15 F	DD
OCING Patterns			MHz: OP.15 F			MHz: OP.15 F	
			ипz. ОР.1 г ИНz: ОР.11 Г			мп2. ОР.1 Г ИНz: ОР.11 Г	
PBCH_RA	dB	201	vii 12. OF . I I I	טט	201	vii 12. OF . FF F	טט
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB		0		0		
PDCCH_RA	dB		Ü				
PDCCH_PB	dB						
PDSCH RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
N_{oc} Note 2	dBm/15		-104		-104		
IV oc	KHz						
\hat{E}_s/N_{oc}	dB	16	-2.5	20	16	-2.5	20
\hat{E}_{s}/I_{ot}	dB	16	-2.5	20	16	-2.5	20
RSRP Note 3	dBm/15	-88	-106.5	-84	-88	-106.5	-84
Note 3	KHz					<u> </u>	
SCH_RP Note 3	dBm/15 KHz	-88	-106.5	-84	-88	-106.5	-84
lo Note 3	dBm/Ch	-60.11	-74.28	-56.18	-60.11	-74.28	-56.18
	BW	+10log	+10log	+10log	+10log	+10log	+10log
		(N _{RB,c} (N _{RB,c} (N _{RB,c} /50) /50)			(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)
Propagation Condition	+	ETU70			/50)	ETU70	700)
Correlation Matrix and	+						
Antenna Configuration		1x2 Low			1x2 Low		
Receive Time offset to cell1 Note 5	μs		-			33	
Note 1. OCNC shall be a		.4 4 1 -				4	

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

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

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

Note 4: The resources for uplink transmission in Cell1 are assigned to the UE prior to the start of time period T3.

Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table A.8.23.1.1-3: DRX-Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
rieiu	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf1280	sf80	
shortDRX	disable	disable	

Table A.8.23.1.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
i ieiu	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.23.1.2 Test Requirements

The UE shall send one Event A2 triggered report for PCell on PCell with a measurement reporting delay less than 6.4s (5*MCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A2 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PCell on PCell with a measurement reporting delay less than 200ms from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

A.8.23.2 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

A.8.23.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of intra frequency measurement. This test will partly verify the FDD intra-frequency cell search requirements in clause 8.8.2 and 8.8.3.

The test parameters are given in Table A.8.23.2.1-1, A.8.23.2.1-2, A.8.23.2.1-3 and A.8.23.2.1-4 below. In the test there are two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. In the measurement control information it is indicated to the UE that event-triggered reporting with Events A1 (PCell and PSCell) and A2 (PCell and PSCell) is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Prior to the start of the time duration T1, DRX configurations on MCG and SCG are enabled and DRX inactivity timers for MCG and SCG have already been expired.

Immediately at beginning of T2 the transmission powers of Cell1 and Cell2 are reduced below a threshold value of event A2 and this shall result in reporting of Event A2 for PCell and PSCell, respectively. Immediately after receiving the reporting of event A2 for both PCell and PSCell, PDCCH indicating a new transmission on Cell1 shall be sent continuously to ensure UE would not enter DRX state on MCG throughout T3. At beginning of T3 the transmission powers of Cell1 and Cell2 are increased above a threshold value of event A1 and this shall result in reporting of Event A1 for PCell and PSCell, respectively.

When MCG DRX is used, the uplink time alignment of Cell1 is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting in Cell1. When SCG DRX is used, the UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment in Cell2. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.23.2.1-1: General test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

	Parameter		Value	Comment
	E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test.
Active	PCell		Cell1	PCell on RF channel number 1.
Config	ured PSCell		Cell2	PSCell on RF channel number 2.
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP			Actual RSRP threshold for event A1.
		dBm	-95	Needs to take absolute accuracy
		abm	-95	tolerance in clause 9.1.11.1 and 9.1.11.2
				into account plus margin.
	Time To Trigger	S	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP			Actual RSRP threshold for event A2.
		dBm	-99	Needs to take absolute accuracy
		ubili		tolerance in clause 9.1.11.1 and 9.1.11.2
				into account plus margin.
	Time To Trigger	S	0	
CP len	gth		Normal	
DRX			ON	DRX related parameters are defined in
			ON	Table A.8.23.2.1-3
Cell-ind	dividual offset for			Individual offset for cells on primary
cells or	n RF channel	dB	0	component carrier.
numbe	r 1			
Cell-ind	dividual offset for			Individual offset for cells on carrier frequency
cells on RF channel		dB	0	of Cell2.
number 2				
Filter coefficient			0	L3 filtering is not used
T1		S	2	
T2		S	10	
T3	·	S	1	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section A.3.11.

Table A.8.23.2.1-2: Cell specific test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Parameter	Unit	Cell 1			Cell 2			
		T1	T2	Т3	T1	T2	Т3	
E-UTRA RF Channel			1			2		
Number								
			$MHz: N_{RB,c} =$		5MHz: N _{RB,c} = 25			
BW _{channel}	MHz		MHz: N _{RB,c} =			$MHz: N_{RB,c} =$		
			MHz: N _{RB,c} =			MHz: N _{RB,c} =		
PDSCH parameters:			MHz: R.5 FD			MHz: R.5 FD		
DL Reference			MHz: R.0 F[OMHz: R.0 F[OMHz: R.4 F[
Measurement Channel			MHz: R.4 FI	טכ	20	JIVINZ. R.4 FL	טכ	
PCFICH/PDCCH/PHICH parameters:		51	ИHz: R.11 F[DD	51	MHz: R.11 F[DD	
DL Reference		10	MHz: R.6 FI	DD	10	DMHz: R.6 FI	DD	
Measurement Channel		20	MHz: R.10 F	DD	20	MHz: R.10 F	DD	
Weastrement Onarmer		5M	1Hz: OP.15 F	חח	5M	1Hz: OP.15 F	חח	
OCNG Patterns			MHz: OP.1 F			MHz: OP.1 F		
			лн. г. Ог. 11 ЛНz: ОР.11 F			инт <u>г</u> . ОР.11 Г		
PBCH_RA	dB	201	3 1	_ _	201			
PBCH_RB	dB							
PSS_RA	dB							
SSS RA	dB							
PCFICH_RB	dB							
PHICH RA	dB							
PHICH_PB	dB		0		0			
PDCCH_RA	dB							
PDCCH_PB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$N_{oc}^{ m Note~2}$	dBm/15		-104		-104			
1 voc	KHz							
\hat{E}_s/N_{oc}	dB	16	-2.5	20	16	-2.5	20	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	16	-2.5	20	16	-2.5	20	
RSRP Note 3	dBm/15 KHz	-88	-106.5	-84	-88	-106.5	-84	
SCH_RP Note 3	dBm/15 KHz	-88	-106.5	-84	-88	-106.5	-84	
lo Note 3	dBm/Ch	-60.11	-74.28	-56.18	-60.11	-74.28	-56.18	
	BW	+10log	+10log	+10log	+10log	+10log	+10log	
		(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	
		/50) /50) /50)			/50)	/50)	/50)	
Propagation Condition		ETU70				ETU70	•	
Correlation Matrix and								
Antenna Configuration		1x2 Low				1x2 Low		
Receive Time offset to cell1 Note 5	μs		-			500		

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

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

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

Note 4: The resources for uplink transmission in Cell1 are assigned to the UE prior to the start of time period T3. Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE

antenna connector including time alignment error between the two cells.

Table A.8.23.2.1-3: DRX-Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
rieiu	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf1280	sf80	
shortDRX	disable	disable	

Table A.8.23.2.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
Field	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.23.2.2 Test Requirements

The UE shall send one Event A2 triggered report for PCell on PCell with a measurement reporting delay less than 6.4s (5*MCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A2 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PCell on PCell with a measurement reporting delay less than 200ms from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

A.8.23.3 E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

A.8.23.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of intra frequency measurement. This test will partly verify the TDD intra-frequency cell search requirements in clause 8.8.2 and 8.8.3.

The test parameters are given in Table A.8.23.3.1-1, A.8.23.3.1-2, A.8.23.3.1-3 and A.8.23.3.1-4 below. In the test there are two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. In the measurement control information it is indicated to the UE that event-triggered reporting with Events A1 (PCell and PSCell) and A2 (PCell and PSCell) is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Prior to the start of the time duration T1, DRX configurations on MCG and SCG are enabled and DRX inactivity timers for MCG and SCG have already been expired.

Immediately at beginning of T2 the transmission powers of Cell1 and Cell2 are reduced below a threshold value of event A2 and this shall result in reporting of Event A2 for PCell and PSCell, respectively. Immediately after receiving the reporting of event A2 for both PCell and PSCell, PDCCH indicating a new transmission on Cell1 shall be sent continuously to ensure UE would not enter DRX state on MCG throughout T3. At beginning of T3 the transmission powers of Cell1 and Cell2 are increased above a threshold value of event A1 and this shall result in reporting of Event A1 for PCell and PSCell, respectively.

When MCG DRX is used, the uplink time alignment of Cell1 is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting in Cell1. When SCG DRX is used, the UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment in Cell2. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.23.3.1-1: General test parameters for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTF	RA RF Channel		1, 2	Two radio channels are used for this test.
Numb	er		1, 2	
Active	PCell		Cell1	PCell on RF channel number 1.
Config	gured PSCell		Cell2	PSCell on RF channel number 2.
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP			Actual RSRP threshold for event A1.
		dBm	0.E	Needs to take absolute accuracy
		abili	-95	tolerance in clause 9.1.11.1 and 9.1.11.2
				into account plus margin.
	Time To Trigger	S	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP			Actual RSRP threshold for event A2.
		dBm	-99	Needs to take absolute accuracy
		abiii		tolerance in clause 9.1.11.1 and 9.1.11.2
				into account plus margin.
	Time To Trigger	S	0	
CP le	ngth		Normal	
Speci	al subframe		6	As specified in table 4.2-1 in TS 36.211.
	uration		0	The same configuration in both cells
Uplink	k-downlink		1	As specified in table 4.2-2 in TS 36.211.
config	uration		I	The same configuration in both cells
DRX			ON	DRX related parameters are defined in
DKX			ON	Table A.8.23.3.1-3
Cell-ir	ndividual offset for			Individual offset for cells on primary
cells o	on RF channel	dB	0	component carrier.
number 1				
Cell-individual offset for				Individual offset for cells on carrier frequency
cells on RF channel		dB	0	of Cell2.
numb	er 2			
Filter coefficient			0	L3 filtering is not used
T1		S	5	
T2		S	10	
T3		S	1	
NOTE	. This took would not	ha DDM sass	. مرج مرح احجاز اجراء أجاري المرج ممرح مراز	dent of channel bandwidth and is norfermed

NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.23.3.1-2: Cell specific test parameters for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			2	
Number							
BW _{channel}	MHz		MHz: N _{RB,c} =			$MHz: N_{RB,c} = 1$	
			$MHz: N_{RB,c} =$			$MHz: N_{RB,c} =$	
BB00H			$MHz: N_{RB,c} =$			$MHz: N_{RB,c} =$	
PDSCH parameters:			MHz: R.4 TD			MHz: R.4 TD	
DL Reference Measurement Channel			MHz: R.0 TE			OMHz: R.0 TE	
PCFICH/PDCCH/PHICH			MHz: R.3 TE	טכ	20	OMHz: R.3 TE	טנ
parameters:		51	MHz: R.11 T	DD		MHz: R.11 TE	
DL Reference			MHz: R.6 TE		10	OMHz: R.6 TE	DD
Measurement Channel		20	MHz: R.10 T	DD	20	MHz: R.10 T	DD
OCNG Patterns		51	MHz: OP.9 TI	חר	51	MHz: OP.9 TI	חח
OCIVO I atterns			MHz: OP.1 T			MHz: OP.1 T	
			MHz: OP.7 T			MHz: OP.7 T	
PBCH_RA	dB			= -			- -
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB		0		0		
PDCCH_RA	dB		-				
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{\text{Note 2}}$	dBm/15		-104		-104		
¹♥ _{oc}	KHz						
\hat{E}_s/N_{oc}	dB	16	-2.5	20	16	-2.5	20
\hat{E}_{s}/I_{ot}	dB	16	-2.5	20	16	-2.5	20
RSRP Note 3	dBm/15 KHz	-88	-106.5	-84	-88	-106.5	-84
SCH_RP Note 3	dBm/15 KHz	-88	-106.5	-84	-88	-106.5	-84
lo Note 3	dBm/Ch	-60.11	-74.28	-56.18	-60.11	-74.28	-56.18
	BW	+10log	+10log	+10log	+10log	+10log	+10log
		(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}
		/50) /50) /50)			/50)	/50)	/50)
Propagation Condition		ETU70			,	ETU70	,
Correlation Matrix and							
Antenna Configuration		1x2 Low				1x2 Low	
Receive Time offset to cell1 Note 5	μs		-			33	

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

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

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

Note 4: The resources for uplink transmission in Cell1 are assigned to the UE prior to the start of time period T3. Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE

antenna connector including time alignment error between the two cells.

Table A.8.23.3.1-3: DRX-Configuration for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
rieiu	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf1280	sf80	
shortDRX	disable	disable	

Table A.8.23.3.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
rieiu	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.23.3.2 Test Requirements

The UE shall send one Event A2 triggered report for PCell on PCell with a measurement reporting delay less than 6.4s (5*MCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A2 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PCell on PCell with a measurement reporting delay less than 200ms from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

A.8.23.4 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

A.8.23.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of inter frequency measurement. This test will partly verify the FDD inter-frequency cell search requirements in clause 8.8.4.

The test parameters are given in Table A.8.23.4.1-1, A.8.23.4.1-2, A.8.23.4.1-3 and A.8.23.4.1-4 below. In the test there are three cells: Cell1, Cell2 and Cell3. Cell1 is PCell, Cell2 is PSCell and Cell3 is a neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Events A3 (PCell) is used. The test consists of two successive time periods, with duration of T1 and T2, respectively. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. During T1 the UE shall not have any information on Cell3.

Prior to the start of the time duration T1, DRX configurations on MCG and SCG are enabled and DRX inactivity timers for MCG and SCG have already been expired.

In this test, UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment in Cell1. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.23.4.1-1: General test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test.
	PCell		Cell1	PCell on RF channel number 1.
Confi	gured PSCell		Cell2	PSCell on RF channel number 2.
Neigh	bour cell		Cell3	Neighbour cell on RF channel number 3.
А3	Hysteresis	dB	0	Hysteresis for evaluation of event A3.
	A3-offset	dB	-6	
	Time To Trigger	S	0	
CP lei	ngth		Normal	
DRX			ON	DRX related parameters are defined in Table A.8.23.4.1-3
Meas	urement gap pattern		0	
	ndividual offset for on RF channel er 1	dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on carrier frequency of Cell3.
Filter coefficient			0	L3 filtering is not used
T1		S	5	
T2	T2		5	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 2: A UE capable of both synchronous and asynchronous DC operations is not required to pass this test case in accordance with the principle defined in section A.3.6.11.

Table A.8.23.4.1-2: Cell specific test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell1		Cell2		Cell3		
		T1	T2	T1	T2	T1	T2	
E-UTRA RF Channel Number			1	2		3		
BW _{channel}	MHz	10MHz:	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$		5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100		5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100	
PDSCH parameters: DL Reference Measurement Channel		5MHz: 10MHz:	R.5 FDD R.0 FDD R.4 FDD	5MHz: I 10MHz:	R.5 FDD R.0 FDD R.4 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		10MHz:	R.11 FDD R.6 FDD R.10 FDD	10MHz:	R.11 FDD R.6 FDD R.10 FDD	10MHz:	11 FDD R.6 FDD R.10 FDD	
OCNG Patterns		10MHz: (P.15 FDD OP.1 FDD OP.11 FDD	10MHz: (P.15 FDD OP.1 FDD)P.11 FDD	10MHz: 0	P.16 FDD OP.2 FDD P.12 FDD	
PBCH_RA PBCH_RB PSS_RA	dB dB dB							
SSS_RA PCFICH_RB PHICH_RA	dB dB dB							
PHICH_PB	dB		0	0)	
PDCCH RA	dB				-		-	
PDCCH_PB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$N_{oc}^{ m Note 2}$	dBm/15 KHz	-1	01	-1	01	N/A	-101	
\hat{E}_s/N_{oc}	dB	4	4	4	4	-infinity	7	
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	4	4	4	4	-infinity	7	
RSRP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94	
SCH_RP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94	
To Note 3	dBm/Ch BW	-67.76 +10log (N _{RB,c} /50)	-67.76 +10log (N _{RB,c} /50)	-67.76 +10log (N _{RB,c} /50)	-67.76 +10log (N _{RB,c} /50)	N/A	-65.43 +10log (N _{RB,c} /50)	
Propagation Condition		ETU70		ETU70		ETI	J70	
Correlation Matrix and Antenna Configuration		1x2	Low	1x2	Low	1x2	Low	
Receive Time offset to cell1 Note 4	μs		-	3	33		-	
Time offset to cell1	μs		-		-	3	3	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted nower								

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

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

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

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table A.8.23.4.1-3: DRX-Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
rieid	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf1280	
shortDRX	disable	disable	

Table A.8.23.4.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
rieiu	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.23.4.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for Cell 3 on PCell, with a measurement reporting delay less than 3.84s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

A.8.23.5 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

A.8.23.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of inter frequency measurement. This test will partly verify the FDD inter-frequency cell search requirements in clause 8.8.4.

The test parameters are given in Table A.8.23.5.1-1, A.8.23.5.1-2, A.8.23.5.1-3 and A.8.23.5.1-4 below. In the test there are three cells: Cell1, Cell2 and Cell3. Cell1 is PCell, Cell2 is PSCell and Cell3 is a neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Events A3 (PCell) is used. The test consists of two successive time periods, with duration of T1 and T2, respectively. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. During T1 the UE shall not have any information on Cell3. Prior to the start of the time duration T1, DRX configurations on MCG and SCG are enabled and DRX inactivity timers for MCG and SCG have already been expired.

In this test, UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment in Cell1. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.23.5.1-1: General test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Parameter		Unit	Value	Comment		
E-UTRA RF Channel			1, 2, 3	Three radio channels are used for this		
Numbe	er		1, 2, 3	test.		
Active	PCell		Cell1	PCell on RF channel number 1.		
Config	ured PSCell		Cell2	PSCell on RF channel number 2.		
Neighb	our cell		Cell3	Neighbour cell on RF channel number 3.		
А3	Hysteresis	dB	0	Hysteresis for evaluation of event A3.		
	A3-offset	dB	-6			
	Time To Trigger	S	0			
CP len	gth		Normal			
DRX			ON	DRX related parameters are defined in		
			ON	Table A.8.23.4.1-3		
Measu	Measurement gap pattern		0			
ld			0			
Cell-in	dividual offset for			Individual offset for cells on primary		
cells o	n RF channel	dB	0	component carrier.		
numbe	er 1					
	dividual offset for			Individual offset for cells on carrier frequency		
	n RF channel	dB	0	of Cell2.		
number 2						
Cell-individual offset for				Individual offset for cells on carrier frequency		
cells on RF channel		dB	0	of Cell3.		
number 3						
	oefficient		0	L3 filtering is not used		
T1		S	5			
T2		S	5			

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section A.3.11.

Table A.8.23.5.1-2: Cell specific test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Parameter	Unit	Cell1		Cell2		Cell3		
		T1	T2	T1	T2	T1	T2	
E-UTRA RF Channel Number			1		2		3	
BW _{channel}	MHz	10MHz:	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$		5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100		5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	
PDSCH parameters: DL Reference Measurement Channel		5MHz: 10MHz:	R.5 FDD R.0 FDD R.4 FDD	5MHz: 10MHz:	R.5 FDD R.0 FDD R.4 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		10MHz:	R.11 FDD R.6 FDD R.10 FDD	10MHz:	R.11 FDD R.6 FDD R.10 FDD	10MHz:	11 FDD R.6 FDD R.10 FDD	
OCNG Patterns		10MHz: (P.15 FDD OP.1 FDD OP.11 FDD	10MHz: (P.15 FDD OP.1 FDD OP.11 FDD	10MHz: 0	P.16 FDD OP.2 FDD P.12 FDD	
PBCH_RA PBCH_RB PSS_RA	dB dB dB							
SSS_RA PCFICH_RB PHICH_RA	dB dB dB							
PHICH_PB	dB		0	0		0		
PDCCH_RA	dB							
PDCCH_PB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$N_{oc}^{ m Note 2}$	dBm/15 KHz	-1	01	-1	01	N/A	-101	
\hat{E}_s/N_{oc}	dB	4	4	4	4	-infinity	7	
\hat{E}_{s}/I_{ot}	dB	4	4	4	4	-infinity	7	
RSRP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94	
SCH_RP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94	
To Note 3	dBm/Ch BW	-67.76 +10log (N _{RB,c} /50)	-67.76 +10log (N _{RB,c} /50)	-67.76 +10log (N _{RB,c} /50)	-67.76 +10log (N _{RB,c} /50)	N/A	-65.43 +10log (N _{RB,c} /50)	
Propagation Condition		ETU70		ETU70		ETI	J70	
Correlation Matrix and Antenna Configuration		1x2	Low	1x2	Low	1x2	Low	
Receive time offset to cell1 Note 4	μs		-	5	00		-	
Time offset to cell1	μs		-		-	4(00	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted nower								

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

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

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

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table A.8.23.5.1-3: DRX-Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
rieid	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf1280	
shortDRX	disable	disable	

Table A.8.23.5.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
rieiu	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.23.5.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for Cell 3 on PCell, with a measurement reporting delay less than 3.84s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

A.8.23.6 E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

A.8.23.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of inter frequency measurement. This test will partly verify the TDD inter-frequency cell search requirements in clause 8.8.4.

The test parameters are given in Table A.8.23.6.1-1, A.8.23.6.1-2, A.8.23.6.1-3 and A.8.23.6.1-4 below. In the test there are three cells: Cell1, Cell2 and Cell3. Cell1 is PCell, Cell2 is PSCell and Cell3 is a neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Events A3 (PCell) is used. The test consists of two successive time periods, with duration of T1 and T2, respectively. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. During T1 the UE shall not have any information on Cell3. Prior to the start of the time duration T1, DRX configurations on MCG and SCG are enabled and DRX inactivity timers for MCG and SCG have already been expired.

In this test, UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment in Cell1. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

Table A.8.23.6.1-1: General test parameters for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test.
Active	PCell		Cell1	PCell on RF channel number 1.
Config	ured PSCell		Cell2	PSCell on RF channel number 2.
Neighb	oour cell		Cell3	Neighbour cell on RF channel number 3.
A3	Hysteresis	dB	0	Hysteresis for evaluation of event A3.
	A3-offset	dB	-6	
	Time To Trigger	S	0	
CP len	ngth		Normal	
	al subframe uration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
DRX			ON	DRX related parameters are defined in Table A.8.23.4.1-3
Measu Id	irement gap pattern		0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on carrier frequency of Cell3.
Filter o	coefficient		0	L3 filtering is not used
T1		s	5	
T2		s	5	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Table A.8.23.4.1-2: Cell specific test parameters for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell1		Cell2		Cell3		
		T1	T2	T1	T2	T1	T2	
E-UTRA RF Channel Number			1		2	3	3	
BW _{channel}	MHz	10MHz:	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$		5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$		5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	
PDSCH parameters: DL Reference Measurement Channel		5MHz: 10MHz:	R.4 TDD R.0 TDD R.3 TDD	5MHz: I 10MHz:	R.4 TDD R.0 TDD R.3 TDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		10MHz:	R.11 TDD R.6 TDD R.10 TDD	10MHz:	R.11 TDD R.6 TDD R.10 TDD	10MHz:	11 TDD R.6 TDD R.10 TDD	
OCNG Patterns		10MHz: (OP.9 TDD OP.1 TDD OP.7 TDD	10MHz: (P.9 TDD OP.1 TDD OP.7 TDD	10MHz: 0	P.10 TDD OP.2 TDD OP.8 TDD	
PBCH_RA PBCH_RB	dB dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH RB	dB							
PHICH_RA	dB							
PHICH_PB	dB		0	0		0		
PDCCH RA	dB			_				
PDCCH_PB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$N_{oc}^{ m Note 2}$	dBm/15 KHz	-1	01	-1	01	N/A	-101	
\hat{E}_s/N_{oc}	dB	4	4	4	4	-infinity	7	
\hat{E}_{s}/I_{ot}	dB	4	4	4	4	-infinity	7	
RSRP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94	
SCH_RP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94	
lo Note 3	dBm/Ch BW	-67.76 +10log (N _{RB,c} /50)	-67.76 +10log (N _{RB,c} /50)	-67.76 +10log (N _{RB,c} /50)	-67.76 +10log (N _{RB,c} /50)	N/A	-65.43 +10log (N _{RB,c} /50)	
Propagation Condition		ETU70		ETU70		ETI	J70	
Correlation Matrix and Antenna Configuration		1x2	Low	1x2	Low	1x2	Low	
Receive Time offset to cell1 Note 4	μs		-	3	33		-	
Time offset to cell1	μs		-		-	3	3	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted nower								

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

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

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

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table A.8.23.6.1-3: DRX-Configuration for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
Field	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS
drx-InactivityTimer	psf1	psf1	36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf1280	
shortDRX	disable	disable	

Table A.8.23.6.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
rieiu	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

A.8.23.6.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for Cell 3 on PCell, with a measurement reporting delay less than 3.84s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

A.8.23.7 E-UTRAN FDD-FDD Addition and Release Delay of known PSCell in Synchronous DC

A.8.23.7.1 Test Purpose and Environment

The purpose of this test is to verify that the PSCell addition and release delays under synchronous dual connectivity are within the requirements stated in section 7.14 for the case when the PSCell is known by the UE at the time of addition.

The test parameters are given in Tables A.8.23.7.1-1 and cell-specific parameters in A.8.23.7.1-2 below. The test consists of five successive time periods with duration of T1, T2, T3, T4 and T5 respectively. There are two carriers each with one cell. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. During T1 only Cell1 is known to the UE.

Before the start of T2 it is indicated to the UE in the measurement control information that event-triggered reporting with Event A4 is configured for neighbour cell (Cell2). Before the start of T2 the UE is configured with the measurement gaps (gap pattern Id # 0). The Cell2 becomes known to the UE during T2. Therefore during T2 the UE shall report Event A4. After receiving the Event A4, the test system shall send a RRC message to the UE to release the measurement gaps.

The test system shall send a RRC message to the UE to add PSCell (Cell 2) on radio channel 2. The RRC message (to add PSCell) also includes a request for the UE to start periodic CSI reporting for the PSCell after the PSCell has been successfully added. The RRC message to add PSCell shall be sent to the UE during period T2, after the measurement gaps are released by the test system. The point in time at which the RRC message to add PSCell (Cell2) is received at the UE antenna connector defines the start of time period T3.

The test system shall observe the periodic reporting of CSI for PSCell during T4. The point in time at which the UE has sent PRACH to the PSCell (Cell 2) defines the start of time period T4.

The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2. The RRC message to release PSCell (Cell2) shall be sent to the UE during time period T4, after the UE has sent at least one CQI report with non-zero CQI index for PSCell (Cell 2). The point in time at which the RRC message to release PSCell (Cell2) is received at the UE antenna connector defines the start of time period T5.

Table A.8.23.7.1-1: General test parameters for known PSCell addition and release case

Parameter		Unit	Value	Comment
E-UTRA RF	Channel Number		1, 2	Two radio channels are used for this test
Initial	Active PCell		Cell1	PCell on RF channel number 1.
Condition	Neighbour cell		Cell2	Neighbour cell on RF channel number 2.
Final	Active PCell		Cell1	PCell on RF channel number 1.
Condition	PSCell		Cell2	PSCell on RF channel number 2.
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A4. Needs to
				take absolute accuracy tolerance in section
				9.1.11.1 into account plus margin.
	Time To Trigger	S	0	
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Measuremen	Measurement gap pattern Id		0	Gaps are configured before T2 and released
				before T3.
	odicity and offset		0	CQI reporting for PSCell every second
	index on cell2		0	subframe
Cell-individua	al offset for cells on	dB	0	Individual offset for cells on primary component
RF channel r	number 1	UD	0	carrier.
Cell-individua	al offset for cells on	dB	0	Individual offset for cells on carrier frequency of
RF channel r	number 2	ub.	0	cell2.
T1		S	5	During this time the PCell shall be known and
			<u> </u>	cell2 shall be unknown.
T2		S	≤ 5	During this time the UE shall identify neighbour
		3		cell (cell2) and report event A4.
	T3		1	During this time the UE adds the PSCell.
T4	T4		1	During this time the UE sends CSI reports for
		S	-	PSCell.
T5	T5		1	During this time the UE releases the PSCell.

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 2: A UE capable of both synchronous and asynchronous DC operations is not required to pass this test case in accordance with the principle defined in section A.3.6.11.

Table A.8.23.7.1-2: Cell specific test parameters for E-UTRAN FDD known PSCell addition and release

Parameter	Unit			Cell 1					Cell 2		
		T1	T2	Т3	T4	T5	T1	T2	Т3	T4	T5
E-UTRA RF Channel Number				1					2		
BW _{channel}	MHz		5MI	Hz: N _{RB,c}	= 25			5MH	lz: N _{RB,c} =	= 25	
				IHz: N _{RB,c}					Hz: N _{RB,c}		
				Hz: N _{RB,c}			20MHz: N _{RB,c} = 100				
PDSCH parameters:				Hz: R.5 F					-		
DL Reference				/lHz: R.0							
Measurement			201	//Hz: R.4	FDD						
Channel				L D 44	EDD			53.41	D 44 F		
PCFICH/PDCCH/PHI				Hz: R.11					lz: R.11 F		
CH parameters: DL				//Hz: R.6					Hz: R.6 F		
Reference			20IV	lHz: R.10	טטזי			ZUIVIF	Hz: R.10	FUU	
Measurement Channel											
OCNG Patterns			5ML	Iz: OP.15	FDD			5MH-	z: OP.16	FDD	
JOING FAILERING				Hz: OP.1					z: OP.2		
				Hz: OP.1					z: OP.12		
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB			0			0				
PDCCH_RA	dB										
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA ^{Note 1}	dB										
OCNG_RB ^{Note 1}	dB										
Noc Note 2	dBm/15			-101			N/A		-8	35	
A 1	kHz	4.0	1.0	1.0	1.0	- 10					
Ê _s /N _{oc}	dB	19	19	19	19	19	-infinity	0	0	0	0
Ê _s /I _{ot} RSRP Note 3	dB	19	19	19	19	19	infinity	0	0	0	0
RSRP	dBm/15 kHz	-82	-82	-82	-82	-82	-infinity	-85	-85	-85	-85
SCH_RP Note 3	dBm/15	-82	-82	-82	-82	-82	-infinity	-85	-85	-85	-85
SCH_KF	kHz	-02	-02	-02	-02	-02	-irillility	-00	-00	-00	-00
To Note 3	dBm/C	-54.16	-54.16	-54.16	-54.16	-54.16	N/A	-54.21	-54.21	-54.21	-54.21
10	h BW	+10log	+10log	+10log	+10log	+10log		+10log	+10log	+10log	+10log
	""	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}		(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}
		/50)	/50)	/50)	/50)	/50)		/50)	/50)	/50)	/50)
Propagation Condition				AWGN					AWGN		
Antenna Configuration				1x2					1x2		
Receive time offset to cell1 Note 4	μs			_					33		
	F										
PRACH configuration Index ^{Note 5}				4					2		
Note 1: OCNG shall	00.0000	ob that al	l collo ore	fully alla	noted on	d a aanat	l ant total tra	nomittad	nower o	no atral da	anaitu ia

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

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Note 5: As specified in table 5.7.1-2 in TS 36.211.

Note 6: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T4.

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

Note 3: Ê_s/I_{ot}, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.23.7.2 Test Requirements

The UE shall transmit the PRACH to PSCell at latest 115 ms into T3.

The UE shall send at least one CSI report for PSCell with non-zero CQI index during T4.

The UE shall stop sending CSI reports for PSCell in at latest 16ms into T5.

All of the above test requirements shall be fulfilled in order for the observed PSCell addition delay and PSCell release delay to be counted as correct. The rate of correct observed PSCell addition delay and PSCell release delay during repeated tests shall be at least 90%.

NOTE: The PSCell addition delay can be expressed as follows as specified in Clause 7.14.2:

$$T_{config\ PSCell} = 15ms + T_{activation\ time} + 50ms + T_{PCell\ DU} + T_{PSCell\ DU}$$

Where:

Tactivation_time = 20 ms (cell2 is known to the UE);

 $T_{PCell_DU} = 0$ (due to PRACH configurations in cell1 and cell2 being orthogonal in time, i.e. non-overlapping in time);

 $T_{PSCell\ DU} = 30 \text{ ms}$ (delay due to PRACH transmission to cell2).

This gives a total of 115 ms.

A.8.23.8 E-UTRAN FDD-FDD Addition and Release Delay of known PSCell in Asynchronous DC

A.8.23.8.1 Test Purpose and Environment

The purpose of this test is to verify that the PSCell addition and release delays under asynchronous dual connectivity are within the requirements stated in section 7.14 for the case when the PSCell is known by the UE at the time of addition.

The test parameters are given in Tables A.8.23.8.1-1 and cell-specific parameters in A.8.23.8.1-2 below. The test consists of five successive time periods with duration of T1, T2, T3, T4 and T5 respectively. There are two carriers each with one cell. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. During T1 only Cell1 is known to the UE.

Before the start of T2 it is indicated to the UE in the measurement control information that event-triggered reporting with Event A4 is configured for neighbour cell (Cell2). Before the start of T2 the UE is configured with the measurement gaps (gap pattern Id # 0). The Cell2 becomes known to the UE during T2. Therefore during T2 the UE shall report Event A4. After receiving the Event A4, the test system shall send a RRC message to the UE to release the measurement gaps.

The test system shall send a RRC message to the UE to add PSCell (Cell 2) on radio channel 2. The RRC message (to add PSCell) also includes a request for the UE to start periodic CSI reporting for the PSCell after the PSCell has been successfully added. The RRC message to add PSCell shall be sent to the UE during period T2, after the measurement gaps are released by the test system. The point in time at which the RRC message to add PSCell (Cell2) is received at the UE antenna connector defines the start of time period T3.

The test system shall observe the periodic reporting of CSI for PSCell during T4. The point in time at which the UE has sent PRACH to the PSCell (Cell 2) defines the start of time period T4.

The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2. The RRC message to release PSCell (Cell2) shall be sent to the UE during time period T4, after the UE has sent at least one CQI report with non-zero CQI index for PSCell (Cell 2). The point in time at which the RRC message to release PSCell (Cell2) is received at the UE antenna connector defines the start of time period T5.

Table A.8.23.8.1-1: General test parameters for known PSCell addition and release case

Parameter		Unit	Value	Comment
E-UTRA RF C	hannel Number		1, 2	Two radio channels are used for this test
Initial	Active PCell		Cell1	PCell on RF channel number 1.
Condition	Neighbour cell		Cell2	Neighbour cell on RF channel number 2.
Final	Active PCell		Cell1	PCell on RF channel number 1.
Condition	PSCell		Cell2	PSCell on RF channel number 2.
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A4. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	S	0	
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Measurement	gap pattern Id		0	Gaps are configured before T2 and released before T3.
CQI/PMI perio configuration i	dicity and offset ndex on cell2		0	CQI reporting for PSCell every second subframe
Cell-individual on RF channe	offset for cells I number 1	dB	0	Individual offset for cells on primary component carrier.
Cell-individual on RF channe	offset for cells I number 2	dB	0	Individual offset for cells on carrier frequency of cell2.
T1			5	During this time the PCell shall be known and cell2 shall be unknown.
T2		S	≤ 5	During this time the UE shall identify neighbour cell (cell2) and report event A4.
T3		S	1	During this time the UE adds the PSCell.
T4	T4		1	During this time the UE sends CSI reports for PSCell.
T5	·	S	1	During this time the UE releases the PSCell.

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in

Note 2: accordance with the principle defined in section A.3.11.

Table A.8.22.8.1-2: Cell specific test parameters for E-UTRAN FDD known PSCell addition and release

Parameter	Unit			Cell 1					Cell 2		
1	İ	T1	T2	T3	T4	T5	T1	T2	Т3	T4	T5
E-UTRA RF Channel				1					2		
Number											
BW _{channel}	MHz		5MHz: $N_{RB,c} = 25$						łz: N _{RB,c} :		
			$10MHz: N_{RB,c} = 50$					Hz: N _{RB,c}			
				Hz: N _{RB,c}				20MF	łz: N _{RB,c} :	= 100	
PDSCH parameters: DL				Hz: R.5 F					-		
Reference				//Hz: R.0							
Measurement Channel				//Hz: R.4							
PCFICH/PDCCH/PHIC				Hz: R.11					lz: R.11 l		
H parameters: DL				//Hz: R.6					Hz: R.6 F		
Reference			20M	Hz: R.10	FDD			20MI	Hz: R.10	FDD	
Measurement Channel											
OCNG Patterns				lz: OP.15					z: OP.16		
				Hz: OP.1					Hz: OP.2		
		<u> </u>	20MF	tz: OP.1	1 FDD			20MF	lz: OP.12	: FDD	
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB			0			0				
PDCCH_RA	dB										
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA ^{Note 1}	dB										
OCNG_RB ^{Note 1}	dB	1									
N _{oc} Note 2	dBm/15			-101			N/A		-8	35	
1 100	kHz										
Ê _s /N _{oc}	dB	19	19	19	19	19	_	0	0	0	0
_5, 100	42	.				10	infinity				
Ê _s /I _{ot}	dB	19	19	19	19	19	infinity	0	0	0	0
RSRP Note 3	dBm/15	-82	-82	-82	-82	-82	-	-85	-85	-85	-85
	kHz	02	02	02	02	02	infinity	00			
SCH_RP Note 3	dBm/15	-82	-82	-82	-82	-82	-	-85	-85	-85	-85
-	kHz	02	02	02	02	02	infinity	00			
lo Note 3	dBm/C	-54.16	-54.16	-54.16	-54.16	-54.16	N/A	-54.21	-54.21	-54.21	-54.21
	h BW	+10log	+10log	+10log	+10log	+10log		+10log	+10log	+10log	+10log
		(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}		(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}
		/50)	/50)	/50)	/50)	/50)		/50)	/50)	/50)	/50)
Propagation Condition				AWGN					AWGN		
Antenna Configuration				1x2					1x2		
Receive time offset to	ne.	_		_]		500		
cell1 Note 4	μs										
			· · · · · · · · · · · · · · · · · · ·								
PRACH configuration Index ^{Note 5}	l			4					2		

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

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

Note 3: Ê_s/I_{ot}, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Note 5: As specified in table 5.7.1-2 in TS 36.211

Note 6: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T4.

A.8.23.8.2 Test Requirements

The UE shall transmit the PRACH to PSCell at latest 115 ms into T3.

The UE shall send at least one CSI report for PSCell with non-zero CQI index during T4.

The UE shall stop sending CSI reports for PSCell in at latest 16ms into T5.

All of the above test requirements shall be fulfilled in order for the observed PSCell addition delay and PSCell release delay to be counted as correct. The rate of correct observed PSCell addition delay and PSCell release delay during repeated tests shall be at least 90%.

NOTE: The PSCell addition delay can be expressed as follows as specified in Clause 7.14.2:

$$T_{config_PSCell} = 15ms + T_{activation_time} + 50ms + T_{PCell_DU} + T_{PSCell_DU}$$

Where:

Tactivation_time = 20 ms (cell2 is known to the UE);

 $T_{PCell_DU} = 0$ (due to PRACH configurations in cell1 and cell2 being orthogonal in time, i.e. non-overlapping in time);

 $T_{PSCell_DU} = 30 \text{ ms}$ (delay due to PRACH transmission to cell2).

This gives a total of 115 ms.

A.8.23.9 E-UTRAN TDD Addition and Release Delay of known PSCell in Synchronous DC

A.8.23.9.1 Test Purpose and Environment

The purpose of this test is to verify that the PSCell addition and release delays under synchronous dual connectivity are within the requirements stated in section 7.14 for the case when the PSCell is known by the UE at the time of addition.

The test parameters are given in Tables A.8.23.9.1-1 and cell-specific parameters in A.8.23.9.1-2 below. The test consists of five successive time periods, with duration of T1, T2, T3, T4 and T5 respectively. There are two carriers each with one cell. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. During T1 only Cell1 is known to the UE.

Before the start of T2 it is indicated to the UE in the measurement control information that event-triggered reporting with Event A4 is configured for neighbour cell (Cell2). Before the start of T2 the UE is configured with the measurement gaps (gap pattern Id # 0). The Cell2 becomes known to the UE during T2. Therefore during T2 the UE shall report Event A4. After receiving the Event A4, the test system shall send a RRC message to the UE to release the measurement gaps.

The test system shall send a RRC message to the UE to add PSCell (Cell 2) on radio channel 2. The RRC message (to add PSCell) also includes a request for the UE to start periodic CSI reporting for the PSCell after the PSCell has been successfully added. The RRC message to add PSCell shall be sent to the UE during period T2, after the measurement gaps are released by the test system. The point in time at which the RRC message to add PSCell (Cell2) is received at the UE antenna connector defines the start of time period T3.

The test system shall observe the periodic reporting of CSI for PSCell during T4. The point in time at which the UE has sent PRACH to the PSCell (Cell 2) defines the start of time period T4.

The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2. The RRC message to release PSCell (Cell2) shall be sent to the UE during time period T4, after the UE has sent at least one CQI report with non-zero CQI index for PSCell (Cell 2). The point in time at which the RRC message to release PSCell (Cell2) is received at the UE antenna connector defines the start of time period T5.

Table A.8.23.9.1-1: General test parameters for known PSCell addition and release case

Para	ameter	Unit	Value	Comment
E-UTRA RF CI	nannel Number		1, 2	Two radio channels are used for this test
Initial	Active PCell		Cell1	PCell on RF channel number 1.
Condition	Neighbour cell	•	Cell2	Neighbour cell on RF channel number 2.
Final	Active PCell		Cell1	PCell on RF channel number 1.
Condition	PSCell		Cell2	PSCell on RF channel number 2.
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold	dBm	-93	Actual RSRP threshold for event A4. Needs to
	RSRP			take absolute accuracy tolerance in section
				9.1.11.1 into account plus margin.
	Time To	S	0	
	Trigger		U	
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Measurement	gap pattern Id		0	Gaps are configured before T2 and released
				before T3.
Special subfrai	me configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlin	k configuration		1	As specified in table 4.2-2 in TS 36.211
PRACH config	uration on cell2		53	As specified in table 5.7.1-3 in TS 36.211
CQI/PMI period	dicity and offset		0	CQI reporting for PSCell every uplink subframe
configuration in	ndex on cell2		U	
Cell-individual	offset for cells on	dB	0	Individual offset for cells on primary component
RF channel nu	mber 1	UD	0	carrier.
Cell-individual	offset for cells on	dB	0	Individual offset for cells on carrier frequency of
RF channel nu	mber 2	UD	0	cell2.
T1		s	5	During this time the PCell shall be known and
		3	3	cell2 shall be unknown.
T2		s	≤ 5	During this time the UE shall identify neighbour
			<u> </u>	cell (cell2) and report event A4.
T3		S	1	During this time the UE adds the PSCell.
T4		s	1	During this time the UE sends CSI reports for
		3	'	PSCell.
T5		S	1	During this time the UE releases the PSCell.
Note 1: This			rement which is	independent of channel bandwidth and is

Table A.8.23.9.1-2: Cell specific test parameters for E-UTRAN TDD known PSCell addition and release

Parameter	Unit		Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	
E-UTRA RF Channel				1					2			
Number												
BW _{channel}	MHz		$5MHz: N_{RB,c} = 25$						łz: N _{RB,c} :			
				IHz: N _{RB,0}					Hz: N _{RB,c}			
				Hz: N _{RB,c}				20MF	Iz: N _{RB,c} :	= 100		
PDSCH parameters: DL				IHz: R.4					-			
Reference				//Hz: R.0								
Measurement Channel				//Hz: R.3								
PCFICH/PDCCH/PHIC				Hz: R.11					lz: R.11			
H parameters: DL				//Hz: R.6					IHz: R.6			
Reference			20N	IHz: R.10	TDD			20M	Hz: R.10	TDD		
Measurement Channel												
OCNG Patterns				Hz: OP.9					z: OP.10			
				Hz: OP.1					Hz: OP.2			
			20M	Hz: OP.7	' TDD			20MI	Hz: OP.8	TDD		
PBCH_RA	dB]										
PBCH_RB	dB]										
PSS_RA	dB											
SSS_RA	dB											
PCFICH_RB	dB											
PHICH_RA	dB											
PHICH_RB	dB			0			0					
PDCCH_RA	dB			-					•			
PDCCH_RB	dB											
PDSCH_RA	dB											
PDSCH_RB	dB											
OCNG_RA ^{Note 1}	dB											
OCNG RR ^{Note 1}	dB											
N _{oc} Note 2	dBm/15			-101			N/A -85					
Noc	kHz			-101			IN/A		-(55		
Ê _s /N _{oc}	dB	19	19	19	19	19	_	0	0	0	0	
Ls/INoc	ub	19	19	19	19	19	infinity	U	U	U	U	
Ê _s /I _{ot}	dB	19	19	19	19	19		0	0	0	0	
RSRP Note 3	_	-82	-82	-82	-82	-82	infinity -	-85	-85	-85	-85	
KSKP	dBm/15	-82	-82	-82	-82	-82		-85	-85	-85	-85	
SCH_RP Note 3	kHz	00	00	00	00	00	infinity	0.5	0.5	0.5	0.5	
SCH_RP	dBm/15	-82	-82	-82	-82	-82	infinit.	-85	-85	-85	-85	
lo Note 3	kHz	-54.16	-54.16	-54.16	-54.16	-54.16	infinity N/A	-54.21	-54.21	-54.21	-54.21	
10	dBm/C	+10log	+10log	+10log	+10log	+10log	IN/A	+10log	+10log	+10log	+10log	
	h BW	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB.c}		(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	(N _{RB,c}	
		/50)	/50)	/50)	/50)	/50)		/50)	/50)	/50)	/50)	
Propagation Condition				AWGN	/	· · · · · · · · · · · · · · · · · · ·			AWGN			
Antenna Configuration				1x2					1x2			
Receive time offset to			IAL									
cell1 Note 4	μs	- 33										
PRACH configuration Index ^{Note 5}			56						50			
Note 1: OCNG shall be	used such th	at all cells	are fully a	llocated ar	nd a const	ant total tra	nsmitted n	ower spec	tral density	v is achiev	ed for al	
OFDM symbols.					501100		р	opoo		,	ai	
Note 2: Interference from shall be modelle	n other cells						ed to be co	onstant ove	er subcarri	iers and tir	me and	
Note 3: Ê _s /I _{ot} , RSRP, SC							or informati	on purpos	es. Thev a	re not sett	able	

Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: As specified in table 5.7.1-3 in TS 36.211

Note 6: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T4.

A.8.23.9.2 Test Requirements

The UE shall transmit the PRACH to PSCell at latest 115 ms into T3.

The UE shall send at least one CSI report for PSCell with non-zero CQI index during T4.

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

The UE shall stop sending CSI reports for PSCell in at latest 16ms into T5.

All of the above test requirements shall be fulfilled in order for the observed PSCell addition delay and PSCell release delay to be counted as correct. The rate of correct observed PSCell addition delay and PSCell release delay during repeated tests shall be at least 90%.

NOTE: The PSCell addition delay can be expressed as follows as specified in Clause 7.14.2:

$$T_{config\ PSCell} = 15ms + T_{activation\ time} + 50ms + T_{PCell\ DU} + T_{PSCell\ DU}$$

Where:

Tactivation time = 20 ms (cell2 is known to the UE);

 $T_{PCell_DU} = 0$ (due to PRACH configurations in cell1 and cell2 being orthogonal in time, i.e. non-overlapping in time);

 $T_{PSCell\ DU} = 30 \text{ ms}$ (delay due to PRACH transmission to cell2).

This gives a total of 115 ms.

A.8.24 Proximity-based Services

A.8.24.1 E-UTRAN FDD - Initiation/Cease of SLSS Transmission with ProSe Direct Discovery

The purpose of this test is to verify the requirements related to the maximum evaluation time allowed to initiate and cease SLSS transmissions defined in clause 8.10.2.1. In the test the UE under test is configured for ProSe operation only on PCell and also the UE is configured only for PCell for WAN. This test is applicable for a UE capable of ProSe Direct Discovery and also SLSS transmission and reception (indicated using *disc-SLSS*).

For this test, the UE is triggered by the test loop function or the upper layers to announce ProSe Direct Discovery.

The test parameters are given in Table A.8.24.1.1-1. Table A.8.24.1.1-2 and Table A.8.24.1.1-3 below. There is one active cell (PCell) in this test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the RSRP of the PCell is above *syncTxThreshIC* and the UE is not expected to be transmitting SLSS. During T2, the RSRP of the PCell is lowered below *syncTxThreshIC* and the UE is expected to initiate SLSS transmissions. During T3, the RSRP of the PCell is increased back to be above *syncTxThreshIC* and the UE is expected to cease SLSS transmissions.

A.8.24.1.1 Test Purpose and Environment

Table A.8.24.1.1-1: Test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	5	
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
Layer 3 filtering		Disabled	L3 filtering is not used
drx-Configuration		DRX_P1	As specified in Table A.3.12.2-1
T1	S	3	
T2	S	5.24	
T3	S	5.24	

Table A.8.24.1.1-2: ProSe Direct Discovery configuration for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	UL carrier frequency
Channel Bandwidth (BW _{channel})	MHz	5	
ProSe Direct Discovery resource pool configuration		As specified in Table A.3.12.4-1 (Configuration #1)	IE values unless specified otherwise in this test.
networkControlledSyncTx		Not configured	
syncTxThreshIC	dBm/15 kHz	-95	In SIB19

Table A.8.24.1.1-3: Cell specific test parameters for initiation/cease of SLSS transmissions test for E-**UTRAN FDD**

Parameter	Unit	Cell 1				
Farameter	Onit	T1	T2	T3		
E-UTRA RF Channel Number			1			
BW _{channel}	MHz		5			
OCNG Pattern (defined in clause A.3.2)			OP.16 FDD			
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB	dB	0				
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA ^{Note 1}						
OCNG_RB ^{Note 1}						
$N_{oc}^{}$ Note2	dBm/15 kHz		-95			
\hat{E}_s/N_{oc}	dB	4.5	-4.5	4.5		
RSRP Note3	dBm/15 kHz	-90.5	-99.5	-90.5		
SCH_RP Note 3	dBm/15 kHz	-90.5	-99.5	-90.5		
Propagation Condition			AWGN			

density is achieved for all OFDM symbols.

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

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

A.8.24.1.2 **Test Requirements**

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 2.24 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 2.24 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: T_{evaluate,SLSS} + *discPeriod*,

Where:

 $T_{\text{evaluate,SLSS}}$ is the evaluation time for initiate/cease of SLSS, and is 1.92 sec (see Table 8.10.2.1-1 in

clause 8.10.2.1) for the parameters in this test;

discPeriod is the discovery period (set as 320ms in this test).

A.8.24.2 E-UTRAN TDD - Initiation/Cease of SLSS Transmission with ProSe Direct Discovery

The purpose of this test is to verify the requirements related to the maximum evaluation time allowed to initiate and cease SLSS transmissions defined in clause 8.10.2.1. In the test the UE under test is configured for ProSe operation only on PCell and also the UE is configured only for PCell for WAN. This test is applicable for a UE capable of ProSe Direct Discovery and also SLSS transmission and reception (indicated using *disc-SLSS*).

For this test, the UE is triggered by the test loop function or the upper layers to announce ProSe Direct Discovery.

The test parameters are given in Table A.8.24.2.1-1. Table A.8.24.2.1-2 and Table A.8.24.2.1-3 below. There is one active cell (PCell) in this test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the RSRP of the PCell is above *syncTxThreshIC* and the UE is not expected to be transmitting SLSS. During T2, the RSRP of the PCell is lowered below *syncTxThreshIC* and the UE is expected to initiate SLSS transmissions. During T3, the RSRP of the PCell is increased back to be above *syncTxThreshIC* and the UE is expected to cease SLSS transmissions.

A.8.24.2.1 Test Purpose and Environment

Table A.8.24.2.1-1: Test parameters for initiation/cease of SLSS transmissions test for E-UTRAN TDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	5	
Active cell		Cell 1	E-UTRA TDD Cell1 on RF channel number 1
Uplink/Downlink Configuration		Config 0	
Special Subframe Configuration		6	
CP length of Cell 1		Normal	
Layer 3 filtering		Disabled	L3 filtering is not used
drx-Configuration		DRX_P1	As specified in Table A.3.12.2-1
T1	S	3	
T2	S	5.24	
T3	S	5.24	

Table A.8.24.1.1-2: ProSe Direct Discovery configuration for initiation/cease of SLSS transmissions test for E-UTRAN TDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth (BW _{channel})	MHz	5	
ProSe Direct Discovery resource pool		As specified in Table	IE values unless specified
configuration		A.3.12.4-3	otherwise in this test.
		(Configuration #3)	
networkControlledSyncTx		Not configured	
syncTxThreshIC	dBm/15 kHz	-95	In SIB19

Table A.8.24.2.1-3: Cell specific test parameters for initiation/cease of SLSS transmissions test for E-UTRAN TDD

Parameter	Unit		Cell 1			
Parameter	Unit	T1	T2	T3		
E-UTRA RF Channel Number		1				
BW _{channel}	MHz		5			
OCNG Pattern (defined in clause A.3.2)		OP.10 TDD				
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB	dB		0			
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA ^{Note 1}						
OCNG_RB ^{Note 1}						
$N_{oc}^{ m Note2}$	dBm/15 kHz	-95				
\hat{E}_s/N_{oc}	dB	4.5	-4.5	4.5		
RSRP Note3	dBm/15 kHz	-90.5	-99.5	-90.5		
SCH_RP Note 3	dBm/15 kHz	-90.5	-99.5	-90.5		
Propagation Condition			AWGN			

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

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

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

A.8.24.2.2 Test Requirements

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 2.24 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 2.24 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: T_{evaluate,SLSS} + *discPeriod*,

Where:

 $T_{\text{evaluate,SLSS}}$ is the evaluation time for initiate/cease of SLSS, and is 1.92 sec (see Table 8.10.2.1-1 in clause 8.10.2.1) for the parameters in this test;

discPeriod is the discovery period (set as 320ms in this test).

A.8.24.3 E-UTRAN FDD - Initiation/Cease of SLSS Transmission with ProSe Direct Communication

The purpose of this test is to verify that the ProSe UE meets the requirements related to the maximum evaluation time allowed to initiate and cease SLSS transmissions defined in clause 8.10.2.2. This test is applicable for a UE capable of ProSe Direct CommunicationIn the test the UE under test is configured for ProSe operation only on PCell and also the UE is configured only for PCell for WAN.

For this test, the UE is triggered by the test loop function or the upper layers to transmit for ProSe Direct Communication.

The test parameters are given in Table A.8.24.3.1-1, Table A.8.24.3.1-2 and Table A.8.24.3.1-3 below. There is one active cell (PCell) in this test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the RSRP of the PCell is above *syncTxThreshIC* and the UE is not expected to be transmitting SLSS. During T2, the RSRP of the PCell is lowered below *syncTxThreshIC* and the UE is expected to initiate SLSS transmissions. During T3, the RSRP of the PCell is increased back to be above *syncTxThreshIC* and the UE is expected to cease SLSS transmissions.

A.8.24.3.1 Test Purpose and Environment

Table A.8.24.3.1-1: Test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	5 or 10	According to principle defined in clause A.3.12.3
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
Layer 3 filtering		Disabled	L3 filtering is not used
drx-Configuration		DRX_P1	As specified in Table A.3.12.2-1
T1	S	3	
T2	S	5.24	
T3	S	5.24	

Table A.8.24.3.1-2: ProSe Direct Communication configuration for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment	
E-UTRA RF Channel Number		1	UL carrier frequency	
Channel Bandwidth (BW _{channel})	MHz	5 or 10	According to principle defined in clause A.3.12.3	
ProSe Direct Communication configuration		As specified in Table A.3.12.5-1 (Configuration #1)	IE values unless specified otherwise in this test.	
networkControlledSyncTx		Not configured		
syncTxThreshIC	dBm/15 kHz	-95	In SIB18	

Table A.8.24.3.1-3: Cell specific test parameters for initiation/cease of SLSS transmissions test for E-**UTRAN FDD**

Parameter	Unit	Cell 1			
Farameter	Onit	T1	T2	T3	
E-UTRA RF Channel Number			1		
BW _{channel} Note 4	MHz	5 or 10			
OCNG Patterns defined in A.3.2.1.2 No	te 4	5MHz: OP.16 FDD 10 MHz: OP.2 FDD			
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB	dB		0		
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA ^{Note 1}					
OCNG_RB ^{Note 1}					
N_{oc} Note2	dBm/15 kHz	-95			
\hat{E}_s/N_{oc}	dB	4.5	-4.5	4.5	
RSRP Note3	dBm/15 kHz	-90.5	-99.5	-90.5	
SCH_RP Note 3	dBm/15 kHz	-90.5	-99.5	-90.5	
Propagation Condition		AWGN			

- density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.
- Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- This test is according to the principle defined in section A.3.12.3. Note 4:

A.8.24.3.2 **Test Requirements**

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 1.96 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 1.96 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: Tevaluate, SLSS + SLSS period,

Where:

is the evaluation time for initiate/cease of SLSS, and is 1.92 sec (see Table 8.10.2.1-1 in T_{evaluate,SLSS}

clause 8.10.2.1) for the parameters in this test;

SLSS period is set to 40ms.

A.9 Measurement Performance Requirements

Unless explicitly stated otherwise:

- Reported measurements shall be within defined range of accuracy limits defined in Clause 9 for at least 90 % of the reported cases. If multiple measurement performance requirements are verified in the same test, the reported measurements for each requirement shall be within defined range of accuracy limits of the corresponding requirement defined in Clause 9 for at least 90% of the reported cases.
- Cell 1 is the PCell.
- Measurements are performed in RRC_CONNECTED state.
- The reference channels assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified.

A.9.1 RSRP

A.9.1.1 FDD Intra frequency case

A.9.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.2.1 and 9.1.2.2 for FDD intra frequency measurements.

A.9.1.1.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.1.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.1.1.2-1: RSRP FDD Intra frequency test parameters

Parameter		Heit	Test 1		Test 2		Test 3	
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
BW _{channel}		MHz	10		1	0	10	
Measurement		$n_{\it PRB}$	22—27			–27		–27
PDSCH Reference channel define	ence measurement		R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH alloca		n_{PRB}	13—36	-	13—36	_	13—36	-
PDCCH/PCFIC	CH/PHICH Reference	PKB						
measurement	channel defined in		R.6 FDD		R.6 FDD		R.6 FDD	
A.3.1.2.1	1.6. 1. 40044							
	s defined in A.3.2.1.1 nd A.3.2.1.2 (OP.2		OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
FDD)	IU A.S.Z. I.Z (OF.Z		FDD	FDD	FDD	FDD	FDD	FDD
PBCH_RA								
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB					0			0
PHICH_RA								
PHICH_RB		dB	0	0		0	0	
PDCCH_RA								
PDCCH_RB PDSCH_RA								
PDSCH_RA								
OCNG_RA ^{Note}	1							
OCNG_RB ^{Note}								
00110_112	Bands FDD_A						-1	16
	Bands FDD_B				-106 -88	-88	-115.5	
	Bands FDD_C						-115	
$N_{oc}^{ m Note2}$	Bands FDD_D	dBm/15 kHz	-106	-106			-114.5	
	Bands FDD_E,	ubiii/13 kHz	100				-114	
	FDD_F Note 5							
	Bands FDD_G Note 7						-113 -112.5	
Ê/I	Bands FDD_H	-ID	0.5	0	0.5	0		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	T	dB	2.5	-6	2.5	-6	0.46	-5.76
	Bands FDD_A						-113	-117
	Bands FDD_B						-112.5	-116.5
	Bands FDD_C						-112	-116
RSRP ^{Note3}	Bands FDD_D Bands FDD_E,	dBm/15 kHz	-100	-105	-82	-87	-111.5	-115.5
	FDD_F Note 5						-111	-115
	Bands FDD_G Note 7						-110	-114
	Bands FDD_H						-109.5	-113.5
	Bands FDD_A							.43
lo ^{Note3}	Bands FDD_B				-70.27 -52.27	-52.27	-81.93	
	Bands FDD_C	dBm/9 MHz		-70.27			-81.43	
	Bands FDD_D		-70.27				-80	.93
	Bands FDD_E, FDD_F Note 5						-80.43	
	Bands FDD_G Note 7						-79.43	
	Bands FDD_H							.93
\hat{E}_s/N_{oc}	-	dB	6	1	6	1	3	-1
Propagation co	ondition	-	Δ\//	GN	AW	'GN	Δ\Λ/	GN
i ropagation of	7. TOTALOTT	-		<u></u>		<u></u>		U14

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over
	subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	Except Band 29 and Band 32.

A.9.1.1.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.2.1 and 9.1.2.2.

A.9.1.2 TDD Intra frequency case

A.9.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.2.1 and 9.1.2.2 for TDD intra frequency measurements.

A.9.1.2.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.2.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.1.2.2-1: RSRP TDD Intra frequency test parameters

Parameter		l lmi4	Test 1		Test 2		Test 3	
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	E-UTRA RF Channel Number		1		1		1	
BW _{channel}	BW _{channel}		10		1	0	10	
Special subfran	Special subframe		6		6		6	
configuration Not	Noto1				_			
Uplink/downlink	configuration Note1		1		1		1	
Measurement b	andwidth	n_{PRB}	22-	–27	22—27		22—27	
PDSCH Refere	nce measurement		R.0	_	R.0	_	R.0	_
channel defined	d in A.3.1.1.2		TDD		TDD		TDD	
PDSCH allocati	ion	n_{PRB}	13—36	-	13—36	1	13—36	-
PDCCH/PCFIC	H/PHICH		R.6 TDD					
Reference mea	surement channel				R.6 TDD		R.6 TDD	
defined in A.3.1								
OCNG Patterns			OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
A.3.2.2.1 (OP.1			TDD	TDD	TDD	TDD	TDD	TDD
A.3.2.2.2 (OP.2	? TDD)							
PBCH_RA		-						
PBCH_RB		-						
PSS_RA		-						
SSS_RA								
PCFICH_RB								
PHICH_RA PHICH_RB		4D	0	_	_	0	_	_
PDCCH_RA		dB	0	0	0	0	0	0
PDCCH_RB		-						
PDSCH_RA		-						
PDSCH_RB		-						
OCNG_RA ^{Note2}		-						
OCNG RB ^{Note2}		1						
	Bands TDD_A						-1	16
$N_{oc}^{ m Note3}$	Bands TDD_C	dBm/15 kHz	-106	-106	-88	-88	-115	
	Bands TDD E			1			-114	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	2.5	-6	2.5	-6	0.5	-5.76
-s/-ot	Bands TDD_A	-		_	_		-113	-117
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-100	-105	05 -82	-87	-112	-116
T COT CI	Bands TDD_E		100				-111	-115
	Bands TDD_A	dBm/9 MHz		-70.27	-52.27	-52.27	-82.43 -81.43	
lo ^{Note4}	Bands TDD_C		-70.27					
	Bands TDD_G						-80.43	
\hat{E}_s/N_{oc}		dB	6	1	6	1	3	-1
	ndition	-	_	-	_	-	_	-
Propagation condition			AW	GIN _	AW	GIN	AVV	'GN

For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 1:

OCNG shall be used such that both cells are fully allocated and a constant total transmitted power Note 2: spectral density is achieved for all OFDM symbols.

Interference from other cells and noise sources not specified in the test is assumed to be constant over Note 3:

subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\it oc}$ to be fulfilled.

RSRP and lo levels have been derived from other parameters for information purposes. They are not Note 4: settable parameters themselves.

RSRP minimum requirements are specified assuming independent interference and noise at each Note 5:

receiver antenna port.

E-UTRA operating band groups are as defined in Section 3.5. Note 6:

A.9.1.2.3 **Test Requirements**

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.2.1 and 9.1.2.2.

A.9.1.3 FDD—FDD Inter frequency case

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.3.1 and 9.1.3.2 for FDD—FDD inter frequency measurements.

A.9.1.3.2 Test parameters

In this set of test cases the cells are on different carrier frequencies. Both absolute and relative accuracy of RSRP interfrequency measurements are tested by using the parameters in Table A.9.1.3.2-1 In all test cases, Cell 1 is the PCell and Cell 2 the target cell. The inter frequency measurements are supported by a measurement gap.

Table A.9.1.3.2-1: RSRP FDD—FDD Inter frequency test parameters

Par	ameter	Unit	Tes		Tes	
E-UTRA RF Channel Number		J	Cell 1	Cell 2	Cell 1	Cell 2
BW _{channel}		MHz	10	2	10	2 10
Gap Pattern Id		IVITIZ	0	10	10	-
Measurement b	pandwidth	n_{PRB}		–27	22—27	
PDSCH Refere	nce measurement d in A.3.1.1.1	TRD	R.0 FDD	-	R.0 FDD	-
PDSCH allocati		$n_{\scriptscriptstyle PRB}$	13—36	-	13—36	-
defined in A.3.1	surement channel .2.1		R.6	FDD	R.6	FDD
OCNG Patterns A.3.2.1.1 (OP.1 A.3.2.1.2 (OP.2	FDD) and		OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote	9	dB	0	0	0	0
$N_{oc}^{$	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H	dBm/15 kHz	-88.65	-88.65	$(N_{oc} \\ \text{for} \\ \text{Channel} \\ 2 + 8 \text{dB})$	-117 -116.5 -116 -115.5 -115 -114 -113.5
\hat{E}_{s}/I_{ot}		dB	10	10	13	-4
RSRP ^{Note3}	Bands FDD_A Bands FDD_B Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H	dBm/15 kHz	-78.65	-78.65	(RSRP for Cell 2 +25dB)	-121 -120.5 -120 -119.5 -119 -118
i contract of the contract of	I DONG EDD A	1	1			-87.76
Io ^{Note3}	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H	dBm/9 MHz	-50.45	-50.45	(lo for Channel 2 +19.75d B)	-87.26 -86.76 -86.26 -85.76 -84.76
lo ^{Note3} \hat{E}_s/N_{oc}	Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7	dBm/9 MHz dB	-50.45 10	-50.45 10	Channel 2 +19.75d	-86.76 -86.26 -85.76 -84.76

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

Interference from other cells and noise sources not specified in the test is assumed

Note 2:

	to be constant over subcarriers and time and shall be modelled as AWGN of
	appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP and lo levels have been derived from other parameters for information
	purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and
	noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of assigned E-
	UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	Except Band 29 and Band 32.

A.9.1.3.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.3.1 and 9.1.3.2.

A.9.1.4 TDD—TDD Inter frequency case

A.9.1.4.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.3.1 and 9.1.3.2 for TDD—TDD inter frequency measurements.

A.9.1.4.2 Test parameters

In this set of test cases the cells are on different carrier frequencies. Both absolute and relative accuracy of RSRP interfrequency measurements are tested by using the parameters in Table A.9.1.4.2-1 for TDD configuration 1 and in Table A.9.1.4.2-2 for TDD configuration 0. In all test cases, Cell 1 is the PCell and Cell 2 the target cell. The inter frequency measurements are supported by a measurement gap.

Table A.9.1.4.2-1: RSRP TDD—TDD Inter frequency test parameters for TDD configuration 1

Dor	ometer	l lmit	Test 1		Test 2		
	ameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	
	Channel Number		1	2	1	2	
BW _{channel}		MHz	10	10	10	10	
Special subfran	ne configuration Note1		(3	(
	k configuration Note1		,	1	,		
Gap	Pattern Id		0	-	0	-	
Measurem	ent bandwidth	$n_{\it PRB}$	22-	–27	22-	–27	
	ence measurement ned in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	
PDSC	d allocation	$n_{\scriptscriptstyle PRB}$	13—36	-	13—36	-	
measurement	H/PHICH Reference channel defined in 3.1.2.2		R.6	TDD	R.6	TDD	
	defined in A.3.2.2.1 A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	
	CH_RA		100	100	וטטו	טטו	
	CH RB					0	
PS	SS_RA			0			
	SS_RA	dB					
	ICH_RB						
	CH_RA						
	CH_RB CH_RA		0		0		
	CH_RB						
	CH_RA						
	CH_RB						
OCN	G RA ^{Note2}						
OCN	G_RB ^{Note2}						
	Bands TDD_A		-88.65	-88.65	(N_{oc})	-117	
$N_{oc}^{$	Bands TDD_C	dBm/15 kHz			for	-116	
	Bands TDD_E				Channel 2 +8dB)	-115	
Ê	$I_{ m ot}/I_{ m ot}$	dB	10	10	13	-4	
	Bands TDD_A				(RSRP	-121	
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-78.65	-78.65	for Cell 2	-120	
	Bands TDD_E				+25dB)	-119	
	Bands TDD_A				(lo for Channel	-87.76	
lo ^{Note4}	Bands TDD_C	dBm/9 MHz	-50.45	-50.45	2	-86.76	
	Bands TDD_E				+19.75d B)	-85.76	
\hat{E}_s	$/N_{oc}$	dB	10	10	13	-4	
Propaga	ion condition	=		GN	AW		
Note 1: For a	pooial aubframe and	بامنامير ماميرها	antiauratia	na aaa Ta	hlaa 1 2 1	and 4.0	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of

appropriate power for $N_{\it oc}$ to be fulfilled.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table A.9.1.4.2-2: RSRP TDD—TDD Inter frequency test parameters for TDD configuration 0

Param E-UTRA RF Cha BW _{cha} Special subframe of Uplink-downlink of Gap Patt Measurement PDSCH Reference channel defined PDSCH al PDCCH/PCFICH/P measurement cha A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PSS SSS PCFICE PURCH	annel Number annel configuration Note1 configuration Note1 tern Id t bandwidth	MHz		Cell 2 2 10	1 10 6	2 10
BW _{chi} Special subframe of Uplink-downlink of Gap Patr Measurement PDSCH Reference channel defined PDSCH al PDCCH/PCFICH/P measurement cha A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PSS_ SSS_ PCFICH	annel configuration Note1 configuration Note1 configuration Note1 tern Id t bandwidth	MHz	10	10 6	10	10
Special subframe of Uplink-downlink of Gap Patrice Measurement PDSCH Reference channel defined PDSCH all PDCCH/PCFICH/P measurement chan A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PSS_ SSS_ PCFICH	configuration ^{Note1} configuration ^{Note1} tern Id t bandwidth	MHz	(6		
Uplink-downlink of Gap Patt Measurement PDSCH Reference channel defined PDSCH all PDCCH/PCFICH/P measurement chan A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PSS_ SSS_ PCFICH	configuration ^{Note1} ttern Id t bandwidth		(6	•
Gap Pati Measurement PDSCH Reference channel defined PDSCH all PDCCH/PCFICH/P measurement chan A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PSS_ SSS_ PCFICH	tern Id t bandwidth			1		
Measurement PDSCH Reference channel defined PDSCH all PDCCH/PCFICH/P measurement characteristics A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PSS_ SSS_ PCFICH	t bandwidth		\cap	,	C)
PDSCH Reference channel defined PDSCH all PDCCH/PCFICH/P measurement chance A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PBCH PSS_ SSS_ PCFICH			U	-	0	-
channel defined PDSCH al PDCCH/PCFICH/P measurement cha A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PSS_ SSS_ PCFICH		$n_{\it PRB}$	22-	–27	22-	-27
PDCCH/PCFICH/P measurement cha A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PSS_ SSS_ PCFICH			R.5 TDD	-	R.5 TDD	-
measurement cha A.3.1. OCNG Patterns de (OP.1 TDD) and A.3 PBCH PBCH PSS_ SSS_ PCFICH	llocation	$n_{\scriptscriptstyle PRB}$	13—36	-	13—36	-
(OP.1 TDD) and A.3 PBCH PBCH PSS_ SSS_ PCFICH	annel defined in		R.6	TDD	R.6	TDD
PBCH PBCH PSS_ SSS_ PCFICH			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH PSS_ SSS_ PCFICH	`		100	וטטו	100	טטו
SSS_ PCFICE	_					0
PCFICH	 _RA					
		dB				
	I_RA					
PHICH PDCCF	_		0	0	0	
PDCCF						
PDSCH						
PDSCH						
OCNG F	RA ^{Note2}					
OCNG_F	RB ^{Note2}					
	Bands TDD_A		-88.65	-88.65	(N_{oc})	-117
$N_{oc}^{ m Note3}$	Bands TDD_C	dBm/15 kHz			for	-116
	Bands TDD_E				Channel 2 +8dB)	-115
$\hat{\mathbf{E}}_{s}$	$\mathbf{I}_{ ext{ot}}$	dB	10	10	13	-4
	Bands TDD_A				(RSRP	-121
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-78.65	-78.65	for Cell 2	-120
	Bands TDD_E				+25dB)	-119
	Bands TDD_A				(lo for Channel	-87.76
lo ^{Note4}	Bands TDD_C	dBm/9 MHz	-50.45	-50.45	2	-86.76
					+19.75d	05.70
\hat{E}_s/N	Bands TDD_E				B)	-85.76
Propagation	V_{oc}	dB	10	10	B) 13	-85.76

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of

appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.4.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.3.1 and 9.1.3.2.

A.9.1.5 FDD—TDD Inter frequency case

A.9.1.5.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.3.1 and 9.1.3.2 for FDD—TDD inter frequency measurements.

A.9.1.5.2 Test parameters

In this set of test cases the cells are on different carrier frequencies. Both absolute and relative accuracy of RSRP inter frequency measurements are tested by using the parameters in Table A.9.1.5.2-1 and Table A.9.1.5.2-2. In all test cases, Cell 1 is the serving cell and Cell 2 the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. The inter frequency measurements are supported by a measurement gap.

Table A.9.1.5.2-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	_	st 1	Test 2		
	Offic	Ce	II 1	Ce	II 1	
E-UTRA RF Channel Number		1		1		
BW _{channel}	MHz	10		1	0	
Gap Pattern Id		()	()	
Measurement bandwidth	n_{PRB}	22-	–27	22-	–27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0	FDD	R.0	FDD	
PDSCH allocation	n_{PRB}	13–	– 36	13-	– 36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6	FDD	R.6	FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD		
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RA PDCCH_RA PDCCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote	dB	0	0	0	0	
$N_{oc}^{$	dBm/15 kHz	-88	3.65	-1	04	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	1	0	1	3	
PSPD ^{Note3}	dBm/15 kHz	-78	3.65	-9	91	
Io ^{Note3}	dBm/9 MHz	-50	.45	-63	3.01	
\hat{E}_s/N_{oc}	dB		0		3	
Propagation condition	-	AW	'GN	AW	'GN	
Note 1: OCNG shall be used suc	h that both cells ar					

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

appropriate power for N_{oc} to be fulfilled.

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

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of

Table A.9.1.5.2-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1 Cell 2	Test 2 Cell 2
E-UTRA RF Channel Number		2	2
BW _{channel}	MHz	10	10
Special subframe configuration Note1		6	6
Uplink-downlink configuration Note 1		1	1
Gap Pattern Id		-	-
Measurement bandwidth	$n_{\scriptscriptstyle PRB}$	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	$n_{{\scriptscriptstyle PRB}}$	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB OCNG_RB OCNG_RB OCNG_RB	dB	0	0
$N_{oc}^{$	dBm/15 kHz	-88.65	-112
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	10	-4
RSRP ^{Note4}	dBm/15 kHz	-78.65	-116
Io ^{Note4}	dBm/9 MHz	-50.45	-82.76
\hat{E}_s/N_{oc}	dB	10	-4
Propagation condition	-	AWGN	AWGN
Note 1: For special subframe and 2 in TS 36.211. Note 2: OCNG shall be used suctransmitted power spectr	h that both cells a	re fully allocated and	a constant total

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of

appropriate power for $\frac{N_{oc}}{N_{oc}}$ to be fulfilled. RSRP and lo levels have been derived from other parameters for information Note 4: purposes. They are not settable parameters themselves.

RSRP minimum requirements are specified assuming independent interference and Note 5: noise at each receiver antenna port.

A.9.1.5.3 **Test Requirements**

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.3.1 and 9.1.3.2.

A.9.1.6 FDD RSRP for E-UTRAN Carrier Aggregation

A.9.1.6.1 Test Purpose and Environment

The purpose of this test is to verify that the FDD RSRP absolute and relative accuracy requirements in carrier aggregation are within the specified limits. This test will verify the absolute RSRP accuracy requirements of the primary component carrier defined in clause 9.1.11.1, the absolute RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.11.2, and the relative RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.11.2. The test will also verify the primary and secondary component carrier relative RSRP accuracy requirement defined in Clause 9.1.11.3.

A.9.1.6.2 Test parameters

In this set of cases cell1 is PCell on the primary component carrier, cell2 is SCell on the secondary component carrier and activated, and cell3 is the neighboring cell on the secondary component carrier. The test parameters are given in Table A.9.1.6.2-1.

Table A.9.1.6.2-1: RSRP FDD carrier aggregation test parameters

Parameter		Unit	Test 1			
		Onit	Cell 1	Cell 2	Cell3	
E-UTRA RF Ch	nannel Number		1	2	2	
BW _{channel}		MHz	10	10	10	
Timing offset to	cell1	μs	-	0	3	
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-	
Measurement b	oandwidth	$n_{\it PRB}$		22—27		
	ence measurement		R.0 FDD	R.0 FDD	-	
channel define			40.00	4000	-	
PDSCH allocat		n_{PRB}	13—36	13—36		
defined in A.3.	asurement channel 1.2.1			R.6 FDD		
OCNG Pattern A.3.2.1.1 (OP.2 A.3.2.1.2 (OP.2	1 FDD) and		OP.1 FDD	OP.1 FDD	OP.2 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RANot		dB	0 -117	0	0	
$N_{oc}^{$	Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/15 kHz	-116.5 -116 -115.5 -115 -114 -113.5	(N_{oc} for Ch	annel 1 +1dB)	
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$		dB	-4	0.46	-5.76	
RSRP ^{Note3}	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Bands FDD_G Bands FDD_G Bands FDD_G Bands FDD_H	dBm/15 kHz	-121 -120.5 -120 -119.5 -119 -118 -117.5	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	
Bands FDD_G Bands FDD_H Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_G Bands FDD_H		dBm/9 MHz	-87.76 -87.26 -86.76 -86.26 -85.76 -84.76 -84.26	(lo for Chanr	nel 1 +5.33dB)	

\hat{E}_s/N_{oc}		dB	-4	3	-1		
Propagat	ion condition	-		AWGN			
Note 1:	OCNG shall be used such				tant total		
Note 2:	transmitted power spectra Interference from other ce	,		,	t is assumed		
Note 2.	to be constant over subca						
	appropriate power for $N_{\scriptscriptstyle o}$	$_{c}$ to be fulfilled.					
Note 3:	RSRP and Io levels have purposes. They are not se		•		mation		
Note 4:	RSRP minimum requirem noise at each receiver and	ents are specified			erference and		
Note 5:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.						
Note 6:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.						
Note 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.						
Note 8:	E-UTRA operating band of						

A.9.1.6.3 Test Requirements

In the test, the performance of RSRP measurements is verified from following four perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRP measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.

A.9.1.7 TDD RSRP for E-UTRAN Carrier Aggregation

The test case in this clause are applicable to carrier aggregation capable UEs which have been configured with a downlink Scell.

A.9.1.7.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the absolute RSRP accuracy on PCell defined in clause 9.1.11.1, the absolute RSRP accuracy on Scell defined in clause 9.1.11.2, the relative RSRP accuracy between SCell and Cell 3 defined in clause 9.1.11.2, and the relative RSRP accuracy between PCell and SCell defined in clause 9.1.11.3.

A.9.1.7.2 Test parameters

In this set of test cases there are three cells on two carrier frequencies. Cell 1 is PCell on channel 1, Cell 2 is activated SCell on channel 2, and Cell 3 is neighbour cell which is also on channel 2. The parameters for the test are listed in Table A.9.1.7.2-1.

Table A.9.1.7.2-1: Carrier aggregation RSRP test parameters for TDD

		Test 1			
Parameter	Unit	Cell 1	Cell 2	Cell 3	
E-UTRA RF Channel Number		1	2	2	
BW _{channel}	MHz		10		
Special subframe configuration Note1			6		
Uplink/downlink configuration Note1			1		
Timing offset to Cell 1	μs	-	0	3	
Time alignment error between cell 2 and cell 1		-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1	-	
Measurement bandwidth	n_{PRB}		22—27		
PDSCH Reference measurement channel defined in A.3.1.1.2		R.0 TDD	R.0 TDD	-	
PDSCH allocation	n_{PRB}	13—36	13—36	-	
PDCCH/PCFICH/PHICH Reference		R.6 TDD			
measurement channel defined in A.3.1.2.2					
OCNG Patterns defined in A.3.2.2.1 (OP.1		OP.1 TDD	OP.1 TDD	OP.2 TDD	
TDD) and A.3.2.2.2 (OP.2 TDD) PBCH_RA					
PBCH_RB PSS_RA SSS_RA PCFICH_RB					
PHICH_RA					
PHICH_RB	dB	0	0	0	
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA ^{Note2} OCNG_RB ^{Note2}					
		447			
Note3 Bands TDD_A Bands TDD_C	dBm/15 kHz	-117 -116	$(N_{oc}$ for	Channel 1	
$N_{oc}^{ m Note3}$ Bands TDD_C Bands TDD E		-115	00	dB)	
		-115			
\hat{E}_{s}/I_{ot}	dB	-4	0.5	-5.76	
RSRP ^{Note4} Bands TDD_C Bands TDD_E	dBm/15 kHz	-121 -120 -119	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	
Bands TDD_A Io ^{Note4} Bands TDD_C Bands TDD_E	dBm/9 MHz	-87.76 -86.76 -85.76	(lo for C	· · · · · · · · · · · · · · · · · · ·	
\hat{E}_s/N_{oc}	dB	-4	3	-1	
Propagation condition	-		AWGN	<u> </u>	
Note 1: For special subframe and uplink-dow	nlink configurati	ons see Table		1.2-2 in TS	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power

for N_{oc} to be fulfilled.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: The selection of the bands for testing depends on the configuration of the carrier

	aggregation supported by the UEs.
Note 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is
	performed according to the principle defined in section A.3.6.1.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.7.3 Test Requirements

In the test, the performance of RSRP measurements is verified form following four perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRP measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3

A.9.1.8 FDD RSRP under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS

A.9.1.8.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.2.3 and 9.1.2.4 for FDD intra-frequency RSRP measurements under timedomain measurement resource restriction with non-MBSFN ABS configured in the aggressor cell.

A.9.1.8.2 Test parameters

In this set of test cases all cells are on the same carrier frequency as PCell. Both absolute and relative accuracy of RSRP intra-frequency measurements are tested, with test parameters specified in Tables A.9.1.8.2-1 and A.9.1.8.2-2.

In the tests there are two synchronous cells, Cell 1 and Cell 2, on the same RF channel. In all test cases, Cell 1 is the serving cell (PCell) and also the aggressor cell to Cell 2. Cell 2 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 2 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 during the test. The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

Table A.9.1.8.2-1: General test parameters for E-UTRAN FDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6	Cell PCIs for Cell 1 and Cell 2 are selected
		!=0	randomly so that the condition is met
ABS pattern		'10000000100000001000 0000100000001000000	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are cofigured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1 Time-domain measurement		'1000000010000001000 00001000000010000000	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [2], clause 6.3.5. measSubframeCellList contains Cell 2. Configured for measurements on Cell 1.
resource restriction pattern for serving cell measurements		00000100000001000000	Comingator for modern months of Coll 1.

Table A.9.1.8.2-2: Cell-specific test parameters for E-UTRAN FDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Doromoto-		11.24	Test 1		Test 2		Test 3		
Pa	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
E-UTRA RF Channel Number			,		1		1		
BW _{channel}		MHz	1	0	10		10		
Measurement b	oandwidth	n_{PRB}	22-	-27	22—27		22-	-27	
PDSCH Refere	ence measurement	TILD	R.0		R.0		R.0		
channel define	d in A.3.1.1.1		FDD	1	FDD	•	FDD		
PDSCH allocat	ion	n_{PRB}	13—36	-	13—36	-	13—36	-	
	CH/PHICH Reference								
A.3.1.2.1	channel defined in		R.6	FDD	R.6	FDD	R.6	FDD	
	s defined in A.3.2.1.5		OP.5	OP.6	OP.5	OP.6	OP.5	OP.6	
	d A.3.2.1.6 (OP.6		FDD	FDD	FDD	FDD	FDD	FDD	
FDD) PBCH_RA									
PBCH_RB									
PCFICH_RB									
PHICH_RA									
PHICH_RB									
PDCCH_RA		dB	Note 6	0	Note 6	0	Note 6	0	
PDCCH_RB		4.2		· ·		· ·			
PDSCH_RA									
PDSCH_RB									
OCNG_RA ^{Note1}									
OCNG_RB ^{Note1}									
PSS_RA		dB	-4	0	-4	0	-4	0	
SSS_RA		dB	-4	0	-4	0	-4	0	
	Bands FDD_A		-106				-116		
	Bands FDD_B							5.5	
Note?	Bands FDD_C	- dBm/15 kHz						-115	
$N_{oc}^{ m Note2}$	Bands FDD_D				-88		-114.5		
	Bands FDD_E, FDD_F Note 7						-1	14	
	Bands FDD_G Note 9						-113		
	Bands FDD_G Bands FDD_H						-112.5		
<u>^</u>									
CRS \hat{E}_s/N_{oc}		dB	5	-2	5	-4	5	-4	
CRS (\hat{E}_s/I_{ot})	Note 5 meas	dB	2.88	-2	3.54	-4	3.54	-4	
SCH \hat{E}_s/I_{ot}	_	dB	-1.12	-5.54	-0.46	-7.54	-0.46	-7.54	
	Bands FDD_A						-111	-120	
	Bands FDD_B						-110.5	-119.5	
	Bands FDD_C						-110	-119	
RSRP Note3,4,5	Bands FDD_D	dBm/15 kHz	-101	-108	-83	-92	-109.5	-118.5	
	Bands FDD_E, FDD_F Note 7						-109	-118	
	Bands FDD_G Note 9						-108	-117	
	Bands FDD_H						-107.5	-116.5	
	Bands FDD_A						-81.63	-85.37	
	Bands FDD_B						-81.13	-84.87	
	Bands FDD_C						-80.63	-84.37	
(IO) Note 3	Bands FDD_D	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-80.13	-83.87	
$(Io)_{meas}^{Note 3}$	Bands FDD_E, FDD_F Note 7	UDIII/9 IVINZ	-/ 1. 4 1	-14.00	-33.63	-31.31	-79.63	-83.37	
	Bands FDD_G Note 9						-78.63	-82.37	
	Bands FDD_H						-78.13	-81.87	
Propagation co			AW	GN	AW	GN		GN	
			•		•				

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over
	subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
	Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.8.3 Test Requirements

Note 8: Note 9:

The absolute RSRP measurement accuracy and relative RSRP measurement accuracy shall fulfill the requirements in Sections 9.1.2.3 and 9.1.2.4, respectively.

A.9.1.9 TDD RSRP under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS

A.9.1.9.1 Test Purpose and Environment

Except Band 29 and Band 32.

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.2.3 and 9.1.2.4 for TDD intra-frequency RSRP measurements under time-domain measurement resource restriction with non-MBSFN ABS configured in the aggressor cell.

A.9.1.9.2 Test parameters

In this set of test cases all cells are on the same carrier frequency as PCell. Both absolute and relative accuracy of RSRP intra-frequency measurements are tested, with test parameters specified in Tables A.9.1.9.2-1 and A.9.1.9.2-2.

In the tests there are two synchronous cells, Cell 1 and Cell 2, on the same RF channel. In all test cases, Cell 1 is the serving cell (PCell) and also the aggressor cell to Cell 2. Cell 2 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 2 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 during the test. The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

Table A.9.1.9.2-1: General test parameters for E-UTRAN TDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Also the aggressor cell.
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe
			configurations see Table 4.2-1 in [16].
Uplink/downlink subframe		1	For Cell 1 and Cell 2. For uplink-downlink
configuration			subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6	Cell PCIs for Cell 1 and Cell 2 are randomly
•		!=0	selected so that the condition is met
ABS pattern		'000000001000000001'	Non-MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are cofigured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'000000001000000001'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [2], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for Cell 1 measurements.

Table A.9.1.9.2-2: Cell-specific test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Devenuetes		Unit	Tes	st 1	Test 2		Test 3	
	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
	nannel Number		•			1		1
BW _{channel}		MHz	10		1	0	1	0
Measurement I	bandwidth	n_{PRB}	22-	–27	22-	–27	22-	–27
PDSCH Refere	ence measurement d in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocat	tion	n_{PRB}	13—36	-	13—36	-	13—36	-
measurement (A.3.1.2.2	CH/PHICH Reference channel defined in		R.6	TDD	R.6	TDD	R.6	TDD
(OP.1 TDD) an TDD)	s defined in A.3.2.2.1 ad A.3.2.2.2 (OP.2		OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
$N_{oc}^{ m Note~2}$	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-1	06	3-	38	-1	16 15 14
CRS \hat{E}_s / N_{oc}		dB	5	-2	5	-4	5	-4
CRS (\hat{E}_s/I_{ot})		dB	2.88	-2	3.54	-4	5	-4
SCH \hat{E}_s/I_{ot}			-1.12	-5.54	-0.46	-7.54	-0.46	-7.54
RSRP Note3,4,5	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-101	-108	-83	-92	-111 -110 -109	-120 -119 -118
(Io) _{meas} Note 3	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.6 -80.6 -79.6	-85.4 -84.4 -83.4
Propagation co			AW		AW			'GN
Note 1: OCI	NG shall be used such	that both cells ar	e fully allo	cated and	a constant	total trans	mitted now	/er

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
- Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
- Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: Applies to restricted measurement subframes of the respective cell.
- Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
- Note 7: E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.9.3 Test Requirements

The absolute RSRP measurement accuracy and relative RSRP measurement accuracy shall fulfill the requirements in Sections 9.1.2.3 and 9.1.2.4, respectively.

A.9.1.10 FDD RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS

A.9.1.10.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.2.3 and 9.1.2.4 for FDD intra-frequency RSRP measurements under timedomain measurement resource restriction with MBSFN ABS configured in the aggressor cell.

A.9.1.10.2 Test parameters

In this set of test cases all cells are on the same carrier frequency as PCell. Both absolute and relative accuracy of RSRP intra-frequency measurements are tested, with test parameters specified in Tables A.9.1.10.2-1 and A.9.1.10.2-2.

In the tests there are two synchronous cells, Cell 1 and Cell 2, on the same RF channel. In all test cases, Cell 1 is the serving cell (PCell) and also the aggressor cell to Cell 2. Cell 2 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 2 are measured for RSRP relative accuracy. MBSFN ABS pattern is configured in Cell 1 during the test. The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

Table A.9.1.10.2-1: General test parameters for E-UTRAN FDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		MBSFN ABS	As defined in Table A.3.4.2.1-1
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6 =0, PCI _{cell1} not equal to PCI _{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'0100000010000001000 00000010000001000000	MBSFN ABS pattern. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'01000000100000001000 00000010000001000000	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331 [2], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'00010000000100000001 00000001000000010000'	Configured for measurements on Cell 1.

Table A.9.1.10.2-2: Cell-specific test parameters for E-UTRAN FDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

			Tes	st 1	Tes	st 2	Tes	st 3
Pai	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Cha	annel Number					1		1
BW _{channel}	armor rambor	MHz		0	10		10	
	a a al cri alth				22—27		22—27	
Measurement b		n_{PRB}		- 27		-21	22-	-21
	nce measurement		R.0	_	R.0	_	R.0	_
channel defined	l in A.3.1.1.1		FDD		FDD		FDD	
PDSCH allocation	on	n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICI	H/PHICH Reference	1 KD						
	hannel defined in		R.6	FDD	R.6	FDD	R.6	FDD
A.3.1.2.1								
OCNG Patterns	defined in A.3.2.1.8		00.0	00.0	00.0	00.0	00.0	00.0
(OP.8 FDD) and	d A.3.2.1.6 (OP.6		OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD
FDD)			FDD	FDD	FDD	FDD	FDD	FDD
PBCH_RA								
PBCH_RB								
PCFICH_RB								
PHICH_RA								
PHICH_RB				_	<u> </u>	_		_
PDCCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PDCCH_RB								
PDSCH_RA								
PDSCH_RB OCNG_RA ^{Note1}								
OCNG_RB Note1								
		4D	4	0	4	0	4	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA	Dondo EDD A	dB	-4	0	-4	0	-4	0
	Bands FDD_A Bands FDD_B							16 5.5
	Bands FDD_C							5.5 15
Note 2	Bands FDD_D	_						4.5
$N_{oc}^{ m Note~2}$		dBm/15 kHz	-1	06	ع۔	38		
	Bands FDD_E, FDD_F Note 8	G.2, 10 11.12					-114	
	Bands FDD_G Note						-113	
	10							
	Bands FDD_H						-112.5	
CRS \hat{E}_s/N_{oc}		dB	5	-2	5	-4	5	-4
		QD.			0	7	0	7
$ CRS (\hat{E}_s/Iot)_n $	Note 5, 7 in the 1 st	٩D	2.88	0.10	2.54	10.10	254	10.10
OFDM symbol	ecus	dB	2.00	-8.19	3.54	-10.19	3.54	-10.19
	Note 5 in OFDM							
	_{neas} Note 5 in OFDM	dB	2.88	-2	3.54	-4	3.54	-4
symbols 4,7,11								
SCH \hat{E}_{s}/I_{ot}		dB	-1.12	-5.54	-0.46	-7.54	-0.46	-7.54
\$ 1 01	Bands FDD_A						-111	-120
	Bands FDD_B						-110.5	-120
	Bands FDD_C						-110.5	-119.5
	Bands FDD_D						-109.5	-118.5
RSRP Note 3,4	Bands FDD F	dBm/15 kHz	-101	-108	-83	-92		
	FDD_F Note 8						-109	-118
	Bands FDD_G Note						100	117
	10						-108	-117
	Bands FDD_H						-107.5	-116.5
	Bands FDD_A						-81.63	-85.37
	Bands FDD_B						-81.13	-84.87
$(Io)_{meas}$ Note 3	Bands FDD_C						-80.63	-84.37
	Bands FDD_D	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-80.13	-83.87
in the 1 st OFDM symbol	Bands FDD_E, FDD_F Note 8				50.50	-51.31	-79.63	-83.37
Syllibul	Pondo EDD O Note							
	Bands FDD_G Note						-78.63	-82.37
	<u> </u>	<u> </u>	<u> </u>			<u> </u>		

	Bands FDD_H						-78.13	-81.87
	Bands FDD_A			-76.09	6.09 -53.63		-81.63	-86.76
	Bands FDD_B					-58.76	-81.13	-86.26
$(Io)_{meas}^{Note 3}$	Bands FDD_C	dBm/9 MHz	-71.41				-80.63	-85.76
in OFDM	Bands FDD_D						-80.13	-85.26
averala ala atla au	Bands FDD_E, FDD_F Note 8						-79.63	-84.76
	Bands FDD_G Note						-78.63	-83.76
	Bands FDD_H						-78.13	-83. 26
Propagation cor	ndition		AW	'GN	AW	GN	AW	GN

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
- Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: Applies to restricted measurement subframes of the respective cell.
- Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.2.1-1.
- Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/lot side condition in 9.1.2.3 and 9.1.2.4.
- Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 9: E-UTRA operating band groups are as defined in Section 3.5.
- Note 10: Except Band 29 and Band 32.

A.9.1.10.3 Test Requirements

The absolute RSRP measurement accuracy and relative RSRP measurement accuracy shall fulfill the requirements in Sections 9.1.2.3 and 9.1.2.4, respectively.

A.9.1.11 TDD RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS

A.9.1.11.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.2.3 and 9.1.2.4 for TDD intra-frequency RSRP measurements under time-domain measurement resource restriction with MBSFN ABS configured in the aggressor cell.

A.9.1.11.2 Test parameters

In this set of test cases all cells are on the same carrier frequency as PCell. Both absolute and relative accuracy of RSRP intra-frequency measurements are tested, with test parameters specified in Tables A.9.1.11.2-1 and A.9.1.11.2-2.

In the tests there are two synchronous cells, Cell 1 and Cell 2, on the same RF channel. In all test cases, Cell 1 is the serving cell (PCell) and also the aggressor cell to Cell 2. Cell 2 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 2 are measured for RSRP relative accuracy. MBSFN ABS pattern is configured in Cell 1 during the test. The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

Table A.9.1.11.2-1: General test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		MBSFN ABS	As defined in Table A.3.4.2.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe
			configurations see Table 4.2-1 in [16].
Uplink/downlink subframe		1	For Cell 1 and Cell 2. For uplink-downlink
configuration			subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6	Cell PCIs for Cell 1 and Cell 2 are selected
		=0, PCI _{cell1} not equal to	randomly so that the condition is met
		PCI _{cell2}	
ABS pattern			MBSFN ABS pattern. TDD ABS Pattern Info IE,
		'0000100000000100000'	as defined in TS 36.423 [28], clause 9.2.54.
			Configured in Cell 1.
			The first/leftmost bit corresponds to the
			subframe #0 of a radio frame satisfying SFN
			mod $x = 0$, where x is the size of the bit string
			(20) divided by 10. All ABS subframes are
Time demain reconstruct			MBSFN subframes.
Time-domain measurement		(0000100000000100001	Configured for Cell 2 measurements by
resource restriction pattern for		'00001000000000100000'	measSubframePatternNeigh IE in
neighbour cell measurements on RF Channel 1			measSubframePatternConfigNeigh, as defined in TS 36.331 [2], clause 6.3.5.
RF Channel 1			measSubframeCellList contains Cell 2.
Time-domain measurement		(40000000000000000000000000000000000000	Configured for measurements on Cell 1.
resource restriction pattern for		'1000000001000000000'	
serving cell measurements			

Table A.9.1.11.2-2: Cell-specific test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

		11.24	Test 1		Test 2		Test 3	
Para	meter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Chan	nel Number		•		,			1
BW _{channel}		MHz	1	0	10		10	
Measurement ban		n_{PRB}	22–	–27	22–	–27	22-	–27
PDSCH Reference channel defined in			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation	1	n_{PRB}	13—36	-	13—36	-	13— 36	-
PDCCH/PCFICH/ measurement cha A.3.1.2.2	innel defined in		R.6	TDD	R.6	TDD	R.6	TDD
(OP.5 TDD) and A	efined in A.3.2.2.5 A.3.2.2.2 (OP.2		OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB								
PHICH_RA PHICH_RB PDCCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PDCCH_RB PDSCH_RA PDSCH_RB	PDSCH_RA							
OCNG_RA ^{Note1} OCNG_RB ^{Note1}		40	4	0	4	0	4	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA	Bondo TDD A	dB	-4	0	-4	0	-4	0
$N_{oc}^{ m Note 2}$	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-1	06	-8	88	-1	16 15 14
CRS \hat{E}_s/N_{oc}		dB	5	-2	5	-4	5	-4
CRS $(\hat{E}_s/Iot)_{meas}$	note 5, note 7 in the	dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
1 st OFDM symbol CRS $(\hat{E}_s/Iot)_{meas}$ symbols 4,7,11	s note 5 in OFDM	dB	2.88	-2	3.54	-4	3.54	-4
SCH \hat{E}_s/I_{ot}		dB	-1.12	-5.54	-0.46	-7.54	-0.46	-7.54
RSRP Note 3,4	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-101	-108	-83	-92	-111 -110 -109	-120 -119 -118
$(Io)_{meas}^{\text{Note 3}}$ in the 1 st OFDM	Bands TDD_A Bands TDD_C	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.63 -80.63	-85.37 -84.37
(Io) _{meas} Note 3	Bands TDD_E Bands TDD_A Bands TDD_C		_,	- 0.55	50 55	50	-79.63 -81.63 -80.63	-83.37 -86.76 -85.76
in OFDM symbols other than the 1 st one	Bands TDD_E	dBm/9 MHz	-71.41	-76.09	-53.63	-58.76	-79.63	-84.76
Propagation cond	ition		AW	GN	AW	GN	AW	/GN

Note 1	spectral density is achieved for all OFDM symbols.
Note 2	Interference from other cells and noise sources not specified in the test is assumed to be constant over
	subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3	Applies to all subframes. RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4	 RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port
Note 5	: Applies to restricted measurement subframes of the respective cell.
Note 6	
Note 7	': In the 1 st OFDM symbol, Cell 2 is not expected to meet the Es/lot side condition in 9.1.2.3 and 9.1.2.4.
Note 8	E: E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.11.3 Test Requirements

The absolute RSRP measurement accuracy and relative RSRP measurement accuracy shall fulfill the requirements in Sections 9.1.2.3 and 9.1.2.4, respectively.

A.9.1.12 FDD RSRP for E-UTRAN Carrier Aggregation for 20MHz

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink Scell.

A.9.1.12.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.1.6.1.

A.9.1.12.2 Test parameters

The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.1.12.2-1 will replace the values of corresponding parameters in Tables A.9.1.6.2-1.

Table A.9.1.12.2-1: RSRP FDD carrier aggregation test parameters

Parameter		l locit	Test 1				
	ameter	Unit	Cell 1	Cell 2	Cell 3		
BW _{channel} Note 1		MHz	20	20	20		
Measurement b	andwidth	n_{PRB}		47—52			
PDSCH Refere channel defined	nce measurement d in A.3.1.1.1		R.4 FDD	R.4 FDD	N/A		
PDSCH allocat	ion	$n_{{\scriptscriptstyle PRB}}$	38—61	38—61	N/A		
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1				R.10 FDD			
A.3.2.1.11 (OP	OCNG Patterns defined in A.3.2.1.11 (OP.11 FDD) and A.3.2.1.12 (OP.12 FDD)		OP.11 FDD	OP.11 FDD	OP.12 FDD		
	Bands FDD_A Note 5		-84.75				
	Bands FDD_B Note 5		-84.25				
	Bands FDD_C Note 5		-83.75				
Io ^{Note2}	Bands FDD_D Note 5	dBm/18 MHz	-83.25	(lo for Channel 1 +5.33dB			
	Bands FDD_E Note 5		-82.75				
	Bands FDD_G Note 5		-81.75				
	Bands FDD_H Note 5		-81.25				

- Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.
- Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 3: See Table A.9.1.6.2-1 for the other parameters.
- Note 4: E-UTRA operating band groups are as defined in Section 3.5.
- Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

A.9.1.12.3 Test Requirements

The test requirements defined in section A.9.1.6.3 shall apply to this test case.

A.9.1.13 TDD RSRP for E-UTRAN Carrier Aggregation for 20MHz

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink Scell.

A.9.1.13.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.1.7.1.

A.9.1.13.2 Test parameters

The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.1.13.2-1 will replace the values of corresponding parameters in Tables A.9.1.7.2-1.

Table A.9.1.13.2-1: Carrier aggregation RSRP test parameters for TDD

Parameter		Unit	Test 1						
		Unit	Cell 1	Cell 2	Cell 3				
BW _{channel}	Note 1	MHz		20					
Measurer	ment bandwidth	n_{PRB}		47—52					
	Reference measurement channel n A.3.1.1.2		R.3 TDD	R.3 TDD	N/A				
PDSCH a	allocation	n_{PRB}	38—61	38—61	N/A				
	PCFICH/PHICH Reference ment channel defined in A.3.1.2.2		R.10 TDD						
	atterns defined in A.3.2.2.7 (OP.7 I A.3.2.2.8 (OP.8 TDD)		OP.7 TDD	OP.7 TDD	OP.8 TDD				
lo ^{Note2}	Bands TDD A Note 5		-84.75 -83.75 -82.75 (Io for Channel 1 +5.33dB)						
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Note 2: lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.									
Note 3: Note 4: Note 5:	E-UTRA operating band groups are a	is defined in Se		hich are supp	Note 3: See Table A.9.1.7.2-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20				

A.9.1.13.3 Test Requirements

The test requirements defined in section A.9.1.7.3 shall apply to this test case.

A.9.1.14 FDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.9.1.14.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.2.5 and 9.1.2.6 for FDD intra-frequency RSRP measurements under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells.

A.9.1.14.2 Test parameters

In this set of test cases all cells are on the same carrier frequency as PCell. Both absolute and relative accuracy of RSRP intra-frequency measurements are tested, with test parameters specified in Tables A.9.1.14.2-1 and A.9.1.14.2-2.

In the tests there are three synchronous cells, Cell 1, Cell2 and Cell 3, on the same RF channel. In all test cases, Cell 1 is the serving cell (PCell) and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test.

The UE is configured by higher layers with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided via RRC to the UE before the measurements start.

Note: It's up to eNB's implementation whether the time domain measurement resource restriction pattern for PCell measurements is configured or not.

Table A.9.1.14.2-1: General test parameters for FDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 3
Neighbour cell		Cell 2	The aggressor cell to Cell 3
Neighbour cell		Cell 3	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
CP length		Normal	For three cells in the test
DRX			OFF
Cell 2 time offset with respect to Cell 1		0μs	Synchronous cells
Cell 3 time offset with respect to Cell 1		-2.5 μs	Synchronous cells
Physical cell ID PCI		Colliding CRS: (PCI _{cell1} – PCI _{cell3})mod6=0, PCI _{cell1} not equal to PCI _{cell3} Non-colliding CRS: (PCI _{cell2} – PCI _{cell3})mod6 !=0	Cell PCIs for three cells are selected randomly so that all conditions are met
ABS pattern		'100000010000001000 0000100000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the Pcell subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'1000000010000001000 00001000000010000000	Time domain measurement resource restriction pattern for neighbor cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured before the measurements start. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'01000000010000000100 00000100000001000000	Configured for measurements on Cell 1.
CRS physCellId		see PCI conditions above	The CRS assistance information is provided for
assistance antennaPortsC		1	Cell 2 only in CRS-AssistanceInfo. It includes a
information ount			single MBSFN-SubframeConfig element with
mbsfn- SubframeConfi gList		oneFrame = '000000'	subframe allocation one Frame='000000'.

Table A.9.1.14.2-2: Cell-specific test parameters for FDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
		Onit	Cell 1 Cell 2 Cell 3		Cell 1 Cell 2 Cell 3			Cell 1	Cell 2	Cell 3	
E-UTRA RF Channel Number		MHz	1			1			1		
	BW _{channel}		10			10			10		
Measurement		n_{PRB}	22—27			22—27	1	22—27			
PDSCH Refere	ence channel defined in		R.0			R.0			R.0		
A.3.1.1.1	channel delined in		FDD	-	-	FDD	-	-	FDD	-	-
PDSCH alloca	tion	n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFIG							l	I.		l	1
Reference mea				R.6 FDD		R.6 FDD		R.6 FDD			
channel define											
A.3.2.1.5 (OP.			OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD
A.3.2.1.6 (OP.	6 FDD)		רטט	ГОО	רטט	FDD	FDD	FDD	FDD	FDD	FDD
PBCH_RA PBCH_RB											
PSS_RA											
SSS_RA											
PCFICH_RB											
PHICH_RA				Note							
PHICH_RB PDCCH_RA		dB	Note 6	6	0	Note 6	Note 6	0	Note 6	Note 6	0
PDCCH_RB											
PDSCH_RA											
PDSCH_RB	4										
OCNG_RA ^{Note}											
OCNG_RB ^{Note}	Bands FDD_A								-116		
	Bands FDD_B	_						-	-115.5		
	Bands FDD_C				-88			-115			
$N_{oc}^{ m Note2}$	Bands FDD_D	dBm/15						-114.5			
oc .	Bands FDD_E, FDD_F Note 7	kHz		-106				-114			
	Bands FDD_G							-113			
	Bands FDD_H							-112.5			
CRS \hat{E}_s/N_{od}	c	dB	4	2	-1.5	4	2	-4	4	2	-4
CRS $(\hat{E}_{\scriptscriptstyle S}/I_{\scriptscriptstyle ot}$	Note 5	dB	-1.18	-0.32	-6.96	-0.75	0.54	-9.46	-0.75	0.54	-9.46
	Bands FDD_A								-112	-114	-120
	Bands FDD_B								-111.5	-113.5	119.5
	Bands FDD_C							-92 <u>-</u>	-111	-113	-119
Note 2.4 F	Bands FDD_D	dBm/15			- 107.5				-110.5	-112.5	118.5
RSRP Note3,4,5	Bands FDD_E, FDD_F Note 7	kHz	-102	-104		-84	-86		-110	-112	-118
	Bands FDD_G Note 9								-109	-111	-117
	Bands FDD_H								-108.5	-110.5	- 116.5
	Bands FDD_A				1			1	-80.82	-85.	
	Bands FDD_B	dBm/9							-80.32	-84.	54
	Bands FDD_C								-79.82	-84.	
(Io) Note 3,5	Bands FDD_D Bands FDD_F		-70.58	_7 <i>1</i>	. 43	-52.82	-57.	04	-79.32	-83.	
$(Io)_{meas}^{Note 3,5}$	Bands FDD_E, FDD_F Note 7	MHz	-/0.58 -/	-74.43	10	-52.82	-57.	∪ 	-78.82	-83.	04
	Bands FDD_G Note 9								-77.82	-82.	
	Bands FDD_H								-77.32	-81.	54
Propagation condition			AWGN		AWGN			AWGN			

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled. Applies to all subframes.
- Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
- Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
- Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
- Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 8: E-UTRA operating band groups are as defined in Section 3.5.
- Note 9: Except Band 29 and Band 32.

A.9.1.14.3 Test Requirements

The absolute RSRP measurement accuracy and relative RSRP measurement accuracy shall fulfill the requirements in Sections 9.1.2.5 and 9.1.2.6, respectively.

A.9.1.15 TDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.9.1.15.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.2.5 and 9.1.2.6 for TDD intra-frequency RSRP measurements under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells.

A.9.1.15.2 Test parameters

In this set of test cases all cells are on the same carrier frequency as PCell. Both absolute and relative accuracy of RSRP intra-frequency measurements are tested, with test parameters specified in Tables A.9.1.15.2-1 and A.9.1.15.2-2.

In the tests there are three synchronous cells, Cell 1, Cell2 and Cell 3, on the same RF channel. In all test cases, Cell 1 is the serving cell (PCell) and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test.

The UE is configured by higher layers with a time domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided via RRC to the UE before the measurements start.

Note: It's up to eNB's implementation whether the time domain measurement resource restriction pattern for PCell measurements is configured or not.

Table A.9.1.15.2-1: General test parameters for TDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 3
Neighbour cell		Cell 2	The aggressor cell to Cell 3
Neighbour cell		Cell 3	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
CP length		Normal	For three cells in the test
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The
'			same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The
			same configuration in both cells
DRX			OFF
Cell 2 time offset with respect to		0μs	Synchronous cells
Cell 1			
Cell 3 time offset with respect to		-2.5 μs	Synchronous cells
Cell 1			
Physical cell ID PCI		Colliding CRS: (PCI _{cell1} –	Cell PCIs for three cells are selected randomly
		PCI _{cell3})mod6=0,	so that all conditions are met
		PCI _{cell1} not equal to	
		PCI _{cell3}	
		Non-colliding CRS:	
		(PCI _{cell2} - PCI _{cell3})mod6	
		!=0	
ABS pattern			TDD ABS Pattern Info IE, as defined in TS
		'000000001000000001'	36.423 [28], clause 9.2.54.
			The first/leftmost bit corresponds to the Pcell
			subframe #0 of the radio frame satisfying SFN
			mod $x = 0$, where x is the size of the bit string
			(20) divided by 10. No MBSFN subframes are
			configured in the ABS subframes. Provided to the UE for Cell 1 and Cell 2 before
			the measurements start.
Time-domain measurement			Time domain measurement resource restriction
resource restriction pattern for		'0000000010000000001'	pattern for neighbor cell measurement signalled
neighbour cell measurements or	,	000000001000000001	to the UE in measSubframePatternNeigh IE in
RF Channel 1	'		measSubframePatternConfigNeigh, as defined
IXI Chamilei i			in TS 36.331, clause 6.3.5.
			Configured before the measurements start. The
			cell list in measSubframeCellList IE shall contain
			Cell 3 but not Cell 2.
Time-domain measurement			Configured for Cell 1 measurements.
resource restriction pattern for		'100000000100000000'	January 101 John 1 Modern of Maria
serving cell measurements			
<u> </u>			
CRS physCellId		see PCI conditions above	The CRS assistance information is provided for
assistance antennaPorts0	.	300 i Oi conditions above	Cell 2 only in CRS-AssistanceInfo. It includes a
information ount	´	1	single MBSFN-SubframeConfig element with
mbsfn-	-	oneFrame = '000000'	subframe allocation one Frame='000000'.
SubframeCon	;		Tames and an arrangement of the first of the
gList	'		
y∟isi		J	<u> </u>

Table A.9.1.15.2-2: Cell-specific test parameters for TDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

Davamatan	I I m ! £	Test 1		Test 2			Test 3			
Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1		1		
BW _{channel}	MHz	10		10			10			
Measurement bandwidth	n_{PRB}	22—27		22—27			22—27			
PDSCH Reference measurement channel defined in A.3.1.1.2		R.0 TDD	-	-	R.0 TDD	-	-	R.0 TDD	-	-
PDSCH allocation	n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD R.6 TDD		R.6 TDD						
OCNG Patterns defined in A.3.2.2.5 (OP.5 TDD) and A.3.2.2.6 (OP.6 TDD)		OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA	_									
SSS_RA PCFICH_RB PHICH_RA		Note 6 0						N. C		
PHICH_RB PDCCH_RA PDCCH_RB	dB			Note 6		0	Note 6		0	
PDSCH_RA PDSCH_RB OCNG_RA ^{Note1} OCNG_RB ^{Note1}										
N _{oc} Note2 Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-106		-88		-116 -115 -114				
CRS \hat{E}_s/N_{oc}	dB	4	2	-1.5	4	2	-4	4	2	-4
CRS $(\hat{E}_s/I_{ot})_{meas}$ Note 5	dB	-1.18	-0.32	-6.96	-0.75	0.54	-9.46	-0.75	0.54	-9.46
RSRP Note3,4,5 Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-102	-104	- 107.5	-84	-86	-92	-112 -111 -110	-114 -113 -112	-120 -119 -118
(Io) _{meas} Note 3, 5 Bands TDD_A Bands TDD_C Bands TDD_E	dBm/9 MHz	-70.58	-70.58 -74.43		-52.82 -57.04		-80.82 -85.04 -79.82 -84.04 -78.82 -83.04		04	
Propagation condition			AWGN			AWGN			AWGN	

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

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

Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.

Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.

Note 7: E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.15.3 Test Requirements

The absolute RSRP measurement accuracy and relative RSRP measurement accuracy shall fulfill the requirements in Sections 9.1.2.5 and 9.1.2.6, respectively.

A.9.1.16 FDD Intra frequency case for 5MHz Bandwidth

A.9.1.16.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.2.1 and 9.1.2.2 for FDD intra frequency measurements.

A.9.1.16.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.16.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.1.16.2-1: RSRP FDD Intra frequency test parameters for 5MHz Bandwidth

Parameter		Unit	Tes	st 1	Tes	st 2	Test 3	
		Onit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number				1	1		1	
BW _{channel}		MHz	ţ	5	5		5	
Measurement I		n_{PRB}	10—15		10—15		10—15	
	ence measurement		R.5	_	R.5	_	R.5	_
channel define	d in A.3.1.1.1-1		FDD		FDD		FDD	
PDSCH allocat	tion	n_{PRB}	7—17	-	7-17	-	7-17	1
	CH/PHICH Reference							
	channel defined in		R.11 FDD		R.11 FDD		R.11 FDD	
A.3.1.2.1-1	a defined in					1		
OCNG Pattern A.3.2.1.15 (OP			OP.15	OP.16	OP.15	OP.16	OP.15	OP.16
A.3.2.1.16 (OP			FDD	FDD	FDD	FDD	FDD	FDD
PBCH_RA								
PBCH_RB		1						
PSS_RA		1						
SSS_RA		1						
PCFICH_RB		1						
PHICH_RA								
PHICH_RB			0	0	0	0	0	0
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA ^{Note1}								
OCNG_RB ^{Note1}								
$N_{oc}^{ m Note2}$	Bands FDD_N	dBm/15 kHz	-103		-83		-109.5	
\hat{E}_{s}/I_{ot}	•	dB	2.46	-5.97	2.46	-5.97	0.46	-5.76
RSRP ^{Note3}	Bands FDD_N	dBm/15 kHz	-97	-102	-77	-82	-106.5	-110.5
Io ^{Note3} Bands FDD_N		dBm/4.5 MHz	-70.28		-50.28		-78.94	
\hat{E}_s/N_{oc}	\hat{E}_s/N_{oc}		6	1	6	1	3	-1
Propagation condition		-	AW	'GN	AW	'GN	AW	GN
		that both cells ar						-
	Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power							

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

A.9.1.16.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.2.1 and 9.1.2.2.

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

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

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

A.9.1.17 FDD—FDD Inter frequency case for 5MHz Bandwidth

A.9.1.17.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.3.1 and 9.1.3.2 for FDD—FDD inter frequency measurements.

A.9.1.17.2 Test parameters

In this set of test cases the cells are on different carrier frequencies. Both absolute and relative accuracy of RSRP interfrequency measurements are tested by using the parameters in Table A.9.1.17.2-1 In all test cases, Cell 1 is the PCell and Cell 2 the target cell. The inter frequency measurements are supported by a measurement gap.

Table A.9.1.17.2-1: RSRP FDD—FDD Inter frequency test parameters for 5MHz Bandwidth

Parameter		Unit	Tes	st 1	Test 2		
Pa	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	
E-UTRA RF Ch	nannel Number		1	2	1	2	
BW _{channel}		MHz	5	5	5	5	
Gap Pattern Id			0	-	0	-	
Measurement I	oandwidth	$n_{\scriptscriptstyle PRB}$	10–	– 15	10—15		
PDSCH Refere	ence measurement d in A.3.1.1.1		R.5 FDD	-	R.5 FDD	-	
PDSCH allocat	ion	n_{PRB}	7—17	-	7-17	1	
PDCCH/PCFIC Reference mea defined in A.3.	asurement channel		R.11 FDD		R.11 FDD		
OCNG Pattern A.3.2.1.15 (OP A.3.2.1.16 (OP	.15 FDD) and		OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA Note OCNG_RB	1	dB	0	0	0	0	
$N_{oc}^{ m Note2}$	Cell 2: Bands FDD_N	dBm/15 kHz	-85.65	-85.65	-102.5	-110.5	
\hat{E}_{s}/I_{ot}	\hat{E}_{s}/I_{ot}		10	10	13	-4	
RSRP ^{Note3}	Cell 2: Bands FDD_N	dBm/15 kHz	-75.65	-75.65	-89.5	-114.5	
lo ^{Note3} Cell 2: Bands FDD_N		dBm/4.5 MHz	-50.46	-50.46	-64.52	-84.27	
\hat{E}_s/N_{oc}		dB	10	10	13	-4	
Propagation con-		- AWGN AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total						total	

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

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of

appropriate power for N_{oc} to be fulfilled.

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

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel

bandwidth within 865-894 MHz.

Table A.9.1.17.2-1: Void

This test is only applicable for testing inter-frequency requirements for Bands FDD_N. Cell 2 is on the Band under test, and Cell 1 is on another band supported by the UE.

A.9.1.17.3 Test Requirements

Note 6:

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.3.1 and 9.1.3.2.

A.9.1.18 FDD RSRP for E-UTRAN Carrier Aggregation for 10MHz + 5MHz

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink Scell.

A.9.1.18.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.1.6.1.

A.9.1.18.2 Test parameters

The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.1.18.2-1 will replace the values of corresponding parameters in Tables A.9.1.6.2-1.

Table A.9.1.18.2-1: RSRP FDD carrier aggregation test parameters

n-		1114	Test 1				
	rameter	Unit	Cell 1	Cell 2	Cell 3		
BW _{channel} Note 1		MHz	10		5		
Measurement	bandwidth	$n_{\scriptscriptstyle PRB}$	22-27	10	-15		
PDSCH Reference channel define	ence measurement ed in A.3.1.1.1		R.0 FDD	R.5 FDD	N/A		
PDSCH alloca	tion	n_{PRB}	13-36	7-17	N/A		
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD	R.11	FDD		
OCNG Pattern (FDD)	s defined in A.3.2.1		OP.1 FDD	OP.15 FDD	OP.16 FDD		
	Bands FDD_A		-117				
	Bands FDD_B		-116.5				
	Bands FDD_C		-116				
	Bands FDD_D		-115.5				
$N_{oc}^{ m Note2}$	Bands FDD_E, FDD_F	dBm/15 kHz	-115	(N_{oc} for Channel 1 +1c			
	Bands FDD_G		-114				
	Bands FDD_H		-113.5				
	Bands FDD N		N/A				
	Bands FDD_A	dBm/15 kHz	-121				
	Bands FDD_B		-120.5		(RSRP for Cell 1 +4dB)		
	Bands FDD_C		-120				
	Bands FDD_D		-119.5	(RSRP for			
RSRP ^{Note2}	Bands FDD_E, FDD_F		-119	Cell 1 +8dB)			
	Bands FDD_G		-118	+oub)			
	Bands FDD_G Bands FDD_H		-117.5				
	Bands FDD_N	_	N/A				
	Bands FDD_N		-87.76				
	Bands FDD_B		-87.26				
	Bands FDD_B Bands FDD_C		-86.76	N/A			
	Bands FDD_C	_	-86.26				
	Bands FDD_E,	dBm/9 MHz	-00.20				
	FDD_F		-85.76				
	Bands FDD_G		-84.76				
	Bands FDD_H		-84.26				
lo ^{Note2}	Bands FDD_A						
	Bands FDD_B]					
	Bands FDD_C]					
	Bands FDD_D]		(lo for Chara	ol 1 + 2 224D/		
	Bands FDD_E,	dBm/4.5 MHz	N/A	(lo for Channel 1 +2.32			
	FDD_F						
	Bands FDD_G	1					
	Bands FDD_H	1					
	Bands FDD_N			-80.94			

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 2: RSRP and lo levels have been derived from other parameters for information

purposes. They are not settable parameters themselves. Note 3: See Table A.9.1.6.2-1 for the other parameters.

Test Requirements

A.9.1.18.3

The test requirements defined in section A.9.1.6.3 shall apply to this test case.

A.9.1.19 TDD RSRP for E-UTRAN Carrier Aggregation for 10MHz + 5MHz

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink Scell.

A.9.1.19.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.1.7.1.

A.9.1.19.2 Test parameters

The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.1.19.2-1 will replace the values of corresponding parameters in Tables A.9.1.7.2-1.

Table A.9.1.19.2-1: Carrier aggregation RSRP test parameters for TDD

Po	rameter	Unit	Test 1		
	rameter	Onit	Cell 1	Cell 2	Cell 3
BW _{channel} Note 1		MHz	10	5	5
Measurement band	width	$n_{\scriptscriptstyle PRB}$	22-27	10-	15
PDSCH Reference defined in A.3.1.1.2	Reference measurement channel in A.3.1.1.2		R.5 TDD	N/A	
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/P measurement chan	HICH Reference nel defined in A.3.1.2.2		R.6 TDD	R.11 TDD	
OCNG Patterns defined in A.3.2.2 (TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
	Bands TDD_A		-87.76		
	Bands TDD_C	dBm/9 MHz	-86.76	N/A	
lo ^{Note2}	Bands TDD_E		-85.76		
10	Bands TDD_A			(lo for C	oonnol 1
	Bands TDD_C	dBm/4.5MHz	N/A	(lo for Cl	
	Bands TDD_E			+2.32dB)	

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 2: lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: See Table A.9.1.7.2-1 for the other parameters.

A.9.1.19.3 Test Requirements

The test requirements defined in section A.9.1.7.3 shall apply to this test case.

A.9.1.20 FDD RSRP for E-UTRAN Carrier Aggregation for 5MHz + 5MHz bandwidth

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink Scell.

A.9.1.20.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.1.6.1.

A.9.1.20.2 Test parameters

The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.1.20.2-1 will replace the values of corresponding parameters in Tables A.9.1.6.2-1.

Table A.9.1.20.2-1: RSRP FDD carrier aggregation test parameters

P:	Parameter			Test 1	
		Unit	Cell 1	Cell 2	Cell 3
BW _{channel} Note 1		MHz	5	5	5
Measurement	bandwidth	n_{PRB}	10-15	10-15	10-15
PDSCH Refer channel define	ence measurement ed in A.3.1.1.1		R.0 FDD	R.5 FDD	N/A
PDSCH alloca	ation	n_{PRB}	7-17	7-17	-
PDCCH/PCFI Reference me defined in A.3	asurement channel		R.11 FDD	R.11 FDD	R.11 FDD
OCNG Pattern A.3.2.1.15 (OI A.3.2.1.26 (OI	P.15 FDD) and P.16 FDD)		OP.15 FDD	OP.15 FDD	OP.16 FDD
$N_{oc}^{$	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Bands FDD_G Bands FDD_H Bands FDD_N	dBm/15 kHz	-117 -116.5 -116 -115.5 -115 -114 -113.5 -110.5	(N_{oc} for Cha	annel 1 +1dB)
RSRP ^{Note2}	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Bands FDD_G Bands FDD_H Bands FDD_N	dBm/15 kHz	-121 -120.5 -120 -119.5 -119 -118 -117.5 -114.5	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_N Bands FDD_A Note 5		-90.76		
	Bands FDD_B Note 5		-90.26		
	Bands FDD_C Note 5	-	-89.76		
lo ^{Note2}	Bands FDD_D Note 5] 	-89.26		
10	Bands FDD_E, FDD_F Note 5	dBm/4.5 MHz	-88.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_G		-87.76		
	Bands FDD_H	=	-87.26		
Bands FDD_N		-	-84.26		
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Note 2: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table A.9.1.6.2-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5. Note 5: The test applies for F-LITRA operating bands in this band group which are					

The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth. Note 5:

A.9.1.20.3 **Test Requirements**

The test requirements defined in section A.9.1.6.3 shall apply to this test case.

A.9.1.21 TDD RSRP for E-UTRAN Carrier Aggregation for 5MHz + 5MHz bandwidth

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink Scell.

A.9.1.21.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.1.7.1.

A.9.1.21.2 Test parameters

The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.1.21.2-1 will replace the values of corresponding parameters in Tables A.9.1.7.2-1.

Table A.9.1.21.2-1: Carrier aggregation RSRP test parameters for TDD

Parameter	Unit	Test 1		
	Onit	Cell 1	Cell 2	Cell 3
BW _{channel} Note 1	MHz	5	5	5
Measurement bandwidth	n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.3.1.1.2		R.4 TDD	R.4 TDD	N/A
PDSCH allocation	n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.11 TDD	
OCNG Patterns defined in A.3.1.2.9 (OP.9 TDD) and A.3.2.2.10 (OP.10 TDD)		OP.9 TDD	OP.9 TDD	OP.10 TDD
lo ^{Note2} Bands TDD_C Note 5 dBm/4 5MHz -89.7		-90.76 -89.76 -88.76	(Io for Channel 1 +5.33dB)	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Note 2: lo levels have been derived from other parameters for information purposes. They are not				
settable parameters themselves. Note 3: See Table A.9.1.7.2-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MI + 5MHz channel bandwidth.			orting 5MHz	

A.9.1.21.3 Test Requirements

The test requirements defined in section A.9.1.7.3 shall apply to this test case.

A.9.1.22 RSRP for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD

A.9.1.22.1 Test Purpose and Environment

The test case is applicable for TDD-FDD carrier aggregation capable UEs which have been configured with a downlink PCell in FDD and a downlink SCell in TDD.

The purpose of this test is to verify that the RSRP absolute and relative measurements accuracy in TDD-FDD carrier aggregation is within the specified limits. This test will verify the absolute RSRP accuracy requirements of the primary component carrier defined in clause 9.1.11.1, the absolute RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.11.2, the relative RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.11.2 between the SCell and a neighbour cell, and the relative RSRP accuracy requirements of the PCell compared to the SCell defined in Clause 9.1.11.3.

A.9.1.22.2 Test parameters

In this test case, Cell 1 is the PCell on the FDD primary component carrier, Cell 2 is the configured and activated SCell on the TDD secondary component carrier, and Cell 3 is the neighboring cell on the TDD secondary component carrier. The test parameters are given in Table A.9.1.22.2-1.

Table A.9.1.22.2-1: RSRP TDD-FDD carrier aggregation test parameters

Pai	rameter	Unit		Test 1	
		Offic	Cell 1	Cell 2	Cell3
E-UTRA RF Ch	nannel Number		1	2	2
			5MHz: N _{RB,c} = 25	5MHz:	5MHz: N _{RB,c}
			10MHz:	$N_{RB,c} = 25$	= 25
BW _{channel}			$N_{RB,c} = 50$	10MHz:	10MHz:
			20MHz:	$N_{RB,c} = 50$ 20MHz:	$N_{RB,c} = 50$ 20MHz:
			$N_{RB,c} =$	$N_{RB,c} = 100$	$N_{RB,c} = 100$
Chaoial aubfran	mo		100		1,2,0
Special subfrar configuration Not	te9		-	6	6
Uplink-downlinl	k configuration Note9		-	1	1
	<u> </u>		5MHz: 10-	5MHz: 10-	5MHz: 10-
			15	15	15
Measurement b	oandwidth	n_{PRB}	10MHz:	10MHz:	10MHz: 22-
		PKB	22-27 20MHz:	22-27 20MHz:	27 20MHz: 47-
			47-52	47-52	52
			5MHz:	5MHz: R.4	-
PDSCH Refere	ence measurement		R.5 FDD	TDD	
	d in A.3.1.1.1 and		10MHz:	10MHz:	
A.3.1.1.2	a / a a a		R.0 FDD	R.0 TDD	
			20MHz: R.4 FDD	20MHz: R.3 TDD	
			5MHz: 7-	5MHz: 7-	
			17	17	
PDSCH allocat	ion	$n_{{\scriptscriptstyle PRB}}$	10MHz:	10MHz:	_
1 Boot anotat		PRB	13-36	13-36	
			20MHz: 38-61	20MHz: 38-61	
			5MHz:	5MHz:	5MHz: R.11
			R.11 FDD	R.11 TDD	TDD
PDCCH/PCFIC	asurement channel		10MHz:	10MHz:	10MHz: R.6
	1.2.1 and A.3.1.2.2		R.6 FDD	R.6 TDD	TDD
			20MHz:	20MHz: R.10 TDD	20MHz:
			R.10 FDD 5MHz:	K. IU IDD	R.10 TDD
			OP.15	5MHz:	5MHz:
OCNG Patterns	s defined in		FDD	OP.9 TDD	OP.10 TDD
	I FDD), A.3.2.2.1		10MHz:	10MHz:	10MHz:
	nd A.3.2.2.2 (OP.2		OP.1 FDD	OP.1 TDD	OP.2 TDD
TDD)			20MHz: OP.11	20MHz: OP.7 TDD	20MHz: OP.8 TDD
			FDD	0	00100
	Bands FDD_A		-117		-
	Bands FDD_B		-116.5		-
	Bands FDD_C		-116		-
	Bands FDD_D Bands FDD E,		-115.5		-
$N_{oc}^{ m Note2}$	FDD_F Note 6	dBm/15 kHz	-115		-
	Bands FDD_G	32.11/ 10 KHZ	-114		-
	Bands FDD_H		-113.5		
Bands TDD_A			-		
	Bands TDD_C		-	(N_{oc} for Ch	annel 1 +1dB)
<u>^</u> /-	Bands TDD_E		-		
\hat{E}_s/N_{oc}		dB	-4	3	-1
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-4	0.46	-5.76
	Bands FDD_A		-121	-	-
RSRP ^{Note3}	Bands FDD_B	dBm/15 kHz	-120.5	-	-
	Bands FDD_C		-120 110.5	-	-
Bands FDD_D			-119.5	-	-

	Bands FDD_E, FDD_F Note 6		-119	-	-
	Bands FDD_G	=	-118	-	-
	Bands FDD_H	=	-117.5	-	-
	Bands TDD A		-	(RSRP for	(22224
	Bands TDD_C		-	Cell 1	(RSRP for
	Bands TDD_E	_	-	+8dB)	Cell 1 +4dB)
	Bando 188_E		-87.76 +	. 502)	
	Bands FDD_A		10log(N _{RB} ,		_
	Banas i BB_, t		/50)		
			-87.26 +		
	Bands FDD_B		10log(N _{RB} ,		_
			J50)		
		1	-86.76+		
	Bands FDD_C		10log(N _{RB} ,		-
	_		₀ /50)		
			-86.26+		
	Bands FDD_D		10log(N _{RB,}		-
lo ^{Note3}		alDina / DVA/	_c /50)		
10	Bands FDD_E,	dBm/ BW _{channel}	-85.76+		
	FDD_F Note 6		10log(N _{RB,}	-	
	1 00_1		₀/50)		
		_	-84.76+		
	Bands FDD_G		10log(N _{RB,}		-
			₀/50)		
			-84.26+		
	Bands FDD_H		10log(N _{RB,}		-
	Bands TDD_A		_o /50) -	(Io for Chani	nel 1 +5.33dB
	Bands TDD_C	=	-	+1	Olog
	Bands TDD_E		-	(N _{RB channel2}	N _{RB channel 1}))
Propagation	on condition	-	AWGN	AWGN	AWGN
	Configuration	-	1x2	1x2	1x2
Timing off	set to cell 1	μs	-	0	3
Time align	ment error relative to	_	_	≤TAE	_
cell 1 Note 8					
Note 1:	For special subframe and in TS 36.211.	l uplink-downlink c	onfigurations	see Tables 4.	2-1 and 4.2-2
Note 2:	OCNG shall be used such	h that all cells are	fully allocated	and a constai	nt total
	transmitted power spectra	al density is achiev	ed for all OFI	OM symbols.	
Note 3:	Interference from other co				
	to be constant over subca		d shall be mo	delled as AW	GN of
	appropriate power for to				
Note 4:	Es/lot, RSRP and lo leve				or information
	purposes. They are not s				
Note 5:	RSRP minimum requirem		assuming ind	dependent inte	rrerence and
NI-4	noise at each receiver an			- C C C	L
Note 6:	The selection of the bands for testing depends on the configuration of the carrier				
Note 7:	aggregation supported by the UEs. For Band 26, the tests shall be performed with the carrier frequency of the assigned				
Note 7:				rrequency of	irie assigned
Note 9:	E-UTRA channel bandwig			N clause 6 F 2	1 Tho TAE
Note 8:	Time alignment error (TA value depends upon the t			กู clause ช.อ.ฮ	. I. IIIU IAE
Note 9:				35	
NOIG 3.	E-UTRA operating band groups are as defined in Section 3.5.				

A.9.1.22.3 Test Requirements

In the test, the performance of RSRP measurements is verified from following four perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.

- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRP measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.A.9.1.23 RSRP for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD

A.9.1.23.1 Test Purpose and Environment

The test case is applicable for TDD-FDD carrier aggregation capable UEs which have been configured with a downlink PCell in TDD and a downlink SCell in FDD.

The purpose of this test is to verify that the RSRP absolute and relative measurements accuracy in TDD-FDD carrier aggregation is within the specified limits. This test will verify the absolute RSRP accuracy requirements of the primary component carrier defined in clause 9.1.11.1, the absolute RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.11.2, the relative RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.11.2 between the SCell and a neighbour cell, and the relative RSRP accuracy requirements of the PCell compared to the SCell defined in Clause 9.1.11.3.

A.9.1.23.2 Test parameters

In this test case, Cell 1 is the PCell on the TDD primary component carrier, Cell 2 is the configured and activated SCell on the FDD secondary component carrier, and Cell 3 is the neighboring cell on the FDD secondary component carrier. The test parameters are given in Table A.9.1.23.2-1.

Table A.9.1.23.2-1: RSRP TDD-FDD carrier aggregation test parameters

Par	ameter	Unit		Test 1	
-		Onit	Cell 1	Cell 2	Cell3
E-UTRA RF Ch	annel Number		1 5MHz:	2	2
			$N_{RB,c} = 25$	5MHz:	5MHz: N _{RB,c}
			10MHz:	$N_{RB,c} = 25$	= 25
BW _{channel}			$N_{RB,c} = 50$	$10MHz$: $N_{RB.c} = 50$	10MHz: $N_{RB,c} = 50$
			20MHz:	20MHz:	20MHz:
			N _{RB,c} =	$N_{RB,c} = 100$	$N_{RB,c} = 100$
Special subfran	ne		100		,-
configuration Not	e1		6	-	-
Uplink-downlink	configuration ^{Note1}		1	-	-
•	<u> </u>		5MHz: 10-	5MHz: 10-	5MHz: 10-
			15	15	15
Measurement b	andwidth	n_{PRB}	10MHz:	10MHz:	10MHz: 22-
		PKB	22-27 20MHz:	22-27 20MHz:	27 20MHz: 47-
			47-52	47-52	52
			5MHz:	5MHz: R.5	-
DDSCH Boforo	nce measurement		R.4 TDD	FDD	
	d in A.3.1.1.1 and		10MHz:	10MHz:	
A.3.1.1.2	ann and		R.0 TDD	R.0 FDD	
			20MHz: R.3 TDD	20MHz: R.4 FDD	
			5MHz: 7-	5MHz: 7-	
			17	17	
PDSCH allocati	ion	12	10MHz:	10MHz:	
FD3CIT allocati	IOH	n_{PRB}	13-36	13-36	-
			20MHz:	20MHz:	
			38-61	38-61	5MHz: R.11
			5MHz: R.11 TDD	5MHz: R.11 FDD	FDD
PDCCH/PCFIC			10MHz:	10MHz:	10MHz: R.6
	surement channel		R.6 TDD	R.6 FDD	FDD
defined in A.3.1	.2.1 and A.3.1.2.2		20MHz:	20MHz:	20MHz:
			R.10 TDD	R.10 FDD	R.10 FDD
			ENALI	5MHz:	ENALL».
OCNG Patterns	s defined in		5MHz: OP.9 TDD	OP.15 FDD	5MHz: OP.16 FDD
	FDD), A.3.2.2.1		10MHz:	10MHz:	10MHz:
	nd A.3.2.1.2 (OP.2		OP.1 TDD	OP.1 FDD	OP.2 FDD
FDD)	,		20MHz:	20MHz:	20MHz:
			OP.7 TDD	OP.11	OP.12 FDD
	Banda EDD A			FDD	
	Bands FDD_A Bands FDD_B		-		
	Bands FDD_B Bands FDD_C		_		
	Bands FDD_D		-	(N) to 01-	oppol 4 · 4 -4 D\
$N_{oc}^{ m Note~3}$	Bands FDD F			(1V _{oc} for Ch	annel 1 +1dB)
¹ V oc	FDD_F Note 9	dBm/15 kHz	_		
	Bands FDD_G		-		
	Bands FDD_H		147		
	Bands TDD_A Bands TDD_C		-117 -116		-
	Bands TDD_C Bands TDD_E		-115		-
\hat{E}_s/N_{oc}	,	dB	-4	3	-1
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$					
L _s /L _{ot}	Rands EDD A	dB	-4	0.46	-5.76
NI-7	Bands FDD_A Bands FDD_B		-	(RSRP for	(RSRP for
RSRP Note 4	Bands FDD_B Bands FDD_C	dBm/15 kHz	-	Cell 1	Cell 1 +4dB)
	Bands FDD_D		-	+8dB)	30
L		<u>I</u>	1		l

			1	ı	
	Bands FDD_E, FDD_F Note 9		-		
	Bands FDD_0	3	-		
	Bands FDD_h	1	-		
	Bands TDD A	4	-121		
	Bands TDD_0		-120	-	-
	Bands TDD_E		-119		
	Bands FDD_A		-		
	Bands FDD E		-		
	Bands FDD_0		-		
	Bands FDD_0		-		hannel 1
	Bands FDD F	:			B+10log
	FDD_F Note 9		-	(INRB channel2 /	N _{RB channel 1}))
	Bands FDD_0	}	-		
Note 4	Bands FDD_F	1	-		
Io Note 4		dBm/ BW _{channe} l	-87.76 +		
	Bands TDD_A	4	10log(N _{RB} ,		-
			_⊘ /50)		
			-86.76 +		
	Bands TDD_0		10log(N _{RB} ,		-
			√50)		
		_	-85.76 +		
	Bands TDD_E	=	10log(N _{RB} ,		-
	1141		₀ /50)	414/01/	414/01/
	ion condition	-	AWGN	AWGN	AWGN
	Configuration		1x2	1x2 0	1x2 3
Timing of	fset to cell 1	μs	-	U	3
cell 1 Note	nment error relative to	-	-	≤TAE	-
Note 1:	For special subframe	and uplink-downlink	configurations	see Tables 4.2	2-1 and 4.2-2
	in TS 36.211.	·	· ·		
Note 2:	OCNG shall be used s				nt total
	transmitted power spe				
Note 3:	Interference from other				
	to be constant over su	ubcarriers and time a	nd shall be mo	delled as AW	GN of
	appropriate power for	N_{cc}			
Note 4:			and from attract	, norom -t t-	r information
Note 4:	Es/lot, RSRP and lo le				or information
Note 5:	purposes. They are no RSRP minimum requi				rforonce and
Note 5.	noise at each receive		assummy m	achemaem mile	merence and
Note 6:	The selection of the b		nds on the co	nfiguration of t	he carrier
INOLE U.	aggregation supported		iius oii tiie CO	ingulation of t	no camer
Note 7:			with the carrie	r frequency of	the assigned
110.07.	Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.				
Note 8:	Time alignment error			01 clause 6.5.3	.1. The TAF
1.5.5 5.	value depends upon t			-,	· · · · · · · · · · · · · · · · · · ·
Note 9:				า 3.5.	
	Note 9: E-UTRA operating band groups are as defined in Section 3.5.				

A.9.1.23.3 Test Requirements

In the test, the performance of RSRP measurements is verified from following four perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.

- The relative accuracy of inter-frequency RSRP measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.A.9.1.24 TDD RSRP for E-UTRAN Carrier Aggregation for 20MHz + 10MHz

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink Scell.

A.9.1.24.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.1.7.1.

A.9.1.24.2 Test parameters

The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.1.24.2-1 will replace the values of corresponding parameters in Tables A.9.1.7.2-1.

Table A.9.1.24.2-1: Carrier aggregation RSRP test parameters for TDD

Parameter		Unit		Test 1	
	rameter	Unit	Cell 1	Cell 2	Cell 3
BW _{channel} Note 1		MHz	20	1	0
Measurement band	width	n_{PRB}	47-52	22	-27
PDSCH Reference defined in A.3.1.1.2	measurement channel		R.3 TDD	R.0 TDD	N/A
PDSCH allocation		n_{PRB}	38-61	13-36	N/A
	PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.10 TDD	R.6	TDD
OCNG Patterns def A.3.2.2 (TDD)	OCNG Patterns defined in A.3.2.2 (TDD)		OP.7 TDD	OP.1 TDD	OP.2 TDD
	Bands TDD_A		-84.76		
	Bands TDD_C	dBm/18 MHz	-83.76	N/A	
Io ^{Note2}	Bands TDD_E		-82.76		
10	Bands TDD_A			N/A (Io for Channel 1 +2.33dB)	
	Bands TDD_C	dBm/9MHz	N/A		
Bands TDD_E				12.0	oub)
Note 1: This test	nent which is indep	pendent of cha	annel bandwid	dth and is	
performe	le defined in section	n A.3.6.1.			
	have been derived from o	ther parameters fo	r information	purposes. Th	ey are not
	parameters themselves.				
Note 3: See Tab	le A.9.1.7.2-1 for the other	r parameters.			

A.9.1.24.3 Test Requirements

The test requirements defined in section A.9.1.7.3 shall apply to this test case.

A.9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal

A.9.1.25.1 Test Purpose and Environment

The purpose of this test is to verify that the FDD RSRP absolute and relative measurement accuracies in CRS based discovery signal are within the specified limits. This test will verify the requirements in Sections 9.1.14.2.

A.9.1.25.2 Test parameters

In this test case, all cells are on the same carrier frequency. Both absolute and relative accuracies of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.25.2-1. In this test case, Cell 1 is the PCell and Cell 2 is the target cell. The Cell 2 DMTC configuration is provided to the UE in the *measDS-Config* before the start of the test.

Table A.9.1.25.2-1: RSRP FDD Intra frequency test parameters

Parameter		11.74	Test 1	
		Unit	Cell 1	Cell 2
E-UTRA RF C	hannel Number			1
BW _{channel}		MHz	1	0
Measurement	Measurement bandwidth		22—27	
DTMC period		$n_{\it PRB}$ ms	N/A	160
DTMC period	offset	1110	N/A	10
	al occasion duration	ms	N/A	1
Time offset be	tween cells	μs	2	.3
	ence measurement		R.0	-
channel define			FDD	
PDSCH alloca	tion	n_{PRB}	13—36	-
PDCCH/PCFIC	CH/PHICH Reference			
	channel defined in		R.6	FDD
A.3.1.2.1	- d-fin - d in A O O A A			
	s defined in A.3.2.1.1 nd A.3.2.1.2 (OP.2		OP.1	OP.2
(OP.1 PDD) ai FDD)	IU A.3.2.1.2 (OP.2		FDD	FDD
PBCH RA				
PBCH_RB				
PSS_RA		j		
SSS_RA]		i
PCFICH_RB		_		
PHICH_RA				
PHICH_RB		dB	0	0
PDCCH_RA PDCCH_RB		{		
PDSCH_RA		}		
PDSCH_RB		-		
OCNG_RA ^{Note}	1	1		
OCNG_RB ^{Note}	1			
	Bands FDD_A			
	Bands FDD_B			
Note2	Bands FDD_C			
$N_{oc}^{ m Note2}$	Bands FDD_D	dBm/15 kHz	-106	-106
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7	-		
	Bands FDD_H	-		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	Danao i DD_ii	40	2.5	
$\mathbf{E}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$		dB	2.5	-6
	Bands FDD_A			
	Bands FDD_B	-		
	Bands FDD_C Bands FDD_D	-		
RSRP ^{Note3}	Bands FDD_E,	dBm/15 kHz	-100	-105
	FDD F Note 5			
	Bands FDD_G Note 7	1		
	Bands FDD_H	<u> </u>		
	Bands FDD_A			-
	Bands FDD_B	_		
	Bands FDD_C			
Io ^{Note3}	Bands FDD_D	dBm/9 MHz	-70.27	-70.27
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7	1		
	Bands FDD_G	1		
\hat{E}/N		dР	e	1
\hat{E}_s/N_{oc}		dB	6	
Propagation condition		-	AW	'GN

Note 1:	OCNG shall be used such that both cells are fully allocated and
1,1010 1.	a constant total transmitted power spectral density is achieved
	for all OFDM symbols.
Note 2:	,
Note 2.	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time
	and shall be modelled as AWGN of appropriate power for $N_{oc}^{}$
	to be fulfilled.
Note 3:	RSRP and lo levels have been derived from other parameters
	for information purposes. They are not settable parameters
	themselves.
Note 4:	RSRP minimum requirements are specified assuming
	independent interference and noise at each receiver antenna
	port.
Note 5:	For Band 26, the tests shall be performed with the carrier
	frequency of the assigned E-UTRA channel bandwidth within
	865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
	1 5 5 1
Note 7:	Except Band 29 and Band 32.

A.9.1.25.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.14.2.

A.9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal

A.9.1.26.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP absolute and relative measurement accuracies in CRS based discovery signal are within the specified limits. This test will verify the requirements in Sections 9.1.14.2.

A.9.1.26.2 Test parameters

In this test case all cells are on the same carrier frequency. Both absolute and relative accuracies of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.26.2-1. In this test case, Cell 1 is the PCell and Cell 2 is the target cell. The Cell 2 DMTC configuration is provided to the UE in the *measDS-Config* before the start of the test.

Table A.9.1.26.2-1: RSRP TDD Intra frequency test parameters

Par	Parameter			st 1
E-UTRA RF Channel Number		Unit	Cell 1	Cell 2
	annel Number	MHz		1
BW _{channel}			1	0
Special subfran configuration Note	e1		(6
Uplink/downlink	configuration Note1		,	1
Measurement b	andwidth	n_{PRB}		–27
DTMC period		ms	N/A	160
DTMC period of			N/A	10
	al occasion duration	ms	N/A	2
Time offset bety		μs	_	.3
PDSCH Refere channel defined	nce measurement I in A.3.1.1.2		R.0 TDD	1
PDSCH allocati		n_{PRB}	13—36	1
PDCCH/PCFIC				
defined in A.3.1			R.6	TDD
OCNG Patterns			OP.1	OP.2
A.3.2.2.1 (OP.1			TDD	TDD
A.3.2.2.2 (OP.2	TDD)			
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA		ID.		0
PHICH_RB		dB	0	0
PDCCH_RA PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA ^{Note2}				
OCNG_RB ^{Note2}				
	Dondo TDD A			
$N_{oc}^{ m Note3}$	Bands TDD_A	dDm/45 kHz	106	106
oc .	Bands TDD_C	dBm/15 kHz	-106	-106
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	Bands TDD_E	dB	2.5	-6
s / ot	Davida TDD A			
DCDDNote4	Bands TDD_A	alDuna /4.5 Lillia	400	405
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-100	-105
	Bands TDD_E			
Note 4	Bands TDD_A			
Io ^{Note4}	Bands TDD_C	dBm/9 MHz	-70.27	-70.27
	Bands TDD_E			
\hat{E}_s/N_{oc}	•	dB	6	1
Propagation cor	ndition	-	AW	/GN

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time
	and shall be modelled as AWGN of appropriate power for $^{N_{oc}}$ to be fulfilled.
Note 4:	RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.26.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.14. 2.

A.9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal

A.9.1.27.1 Test Purpose and Environment

The purpose of this test is to verify that the CRS RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.14.2 for FDD—FDD inter frequency measurements.

A.9.1.27.2 Test parameters

In this set of test case the cells are on different carrier frequencies. Both absolute and relative accuracy of CRS RSRP inter-frequency measurements are tested by using the parameters in Table A.9.1.27.2-1. In this test case, Cell 1 is the PCell and Cell 2 the target cell. The inter frequency measurements are supported by a measurement gap and a DMTC configuation.

Table A.9.1.27.2-1: CRS RSRP FDD—FDD Inter frequency test parameters

E-UTRA RF Cha	ameter annel Number	Unit	Cell 1	Cell 2
BW _{channel}	annel Number		1 1	
	E-UTRA RF Channel Number		·	2
		MHz	10	10
	Gap Pattern Id		0	-
gapOffset		ms	9	160
DMTC period of	foot	ms	-	160 10
	occasion duration	ms ms	-	10
Time offset betw		μs	-	3
Measurement ba		•	22-	
		n_{PRB}	22-	-21
channel defined	in A.3.1.1.1		R.0 FDD	-
PDSCH allocation	on	$n_{{\scriptscriptstyle PRB}}$	13—36	-
PDCCH/PCFICH	H/PHICH			
Reference meas	surement channel		R.6 F	-DD
defined in A.3.1.				
OCNG Patterns			OP.1	OP.2
A.3.2.1.1 (OP.1			FDD	FDD
A.3.2.1.2 (OP.2	רטט)			
PBCH_RA PBCH_RB				
PSS_RA				
SSS RA				
PCFICH RB				
PHICH_RA				
PHICH_RB		dB	0	0
PDCCH_RA	-			
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA ^{Note1}				
OCNG_RB ^{Note1}	Davida EDD. A			445
-	Bands FDD_A		$(N_{oc} ext{ for } Channel 2 +6dB)$	-115
	Bands FDD_B Bands FDD_C			-114.5 -114
3.7 Nove	Bands FDD_D			-113.5
$N_{oc}^{ m Note2}$	Bands FDD E,	dBm/15 kHz		
	FDD_F Note 5	3511, 10 KHZ		-113
Ì	Bands FDD_G			110
	Note /			-112
r /r	Bands FDD_H			-111.5
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	13	-6
]	Bands FDD_A			-121
	Bands FDD_B			-120.5
	Bands FDD_C			-120
RSRP ^{Note3}	Bands FDD_D	dBm/15 kHz	(RSRP for	-119.5
KSKP	Bands FDD_E, FDD_F Note 5	UDIII/15 KHZ	Cell 2 +25dB)	-119
Bands FDD G			,,	
	Note 7			-118
	Bands FDD_H			-117.5
	Bands FDD_A			-86.25
<u> </u>	Bands FDD_B			-85.75
<u> </u>	Bands FDD_C			-85.25
Io ^{Note3}	Bands FDD_D	dD=-/0.1411	(lo for	-84.75
lo ^{Note3}	Bands FDD_E, FDD_F Note 5	dBm/9 MHz	Channel 2 +19.68dB)	-84.25
	DI- EDD O			
	Bands FDD_G Note 7			-83.25

\hat{E}_s/N_{oc}		dB	13	-6
Propagation	on condition	-	AW	GN
Note 1:	Note 1: OCNG shall be used such that both cells are fully allocated and constant total transmitted power spectral density is achieved for all OFDM symbols.			
Note 2:	Interference from other ce the test is assumed to be	constant over su	bcarriers and	d time and
	shall be modelled as AWO	GN of appropriate	e power for	v _{oc} to be
Note 3:	fulfilled. RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.			
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz.			
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.			
Note 7: Note 8:	Except Band 29 and Band DMTC is provided to the UE the beginning of the test		<i>nfig</i> (in TS36.3	331) before

A.9.1.27.3 Test Requirements

The CRS RSRP measurement accuracy shall fulfil the requirements in sections 9.1.14.2.

A.9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal

A.9.1.28.1 Test Purpose and Environment

The purpose of this test is to verify that the CRS RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.14.2 for TDD—TDD inter frequency measurements.

A.9.1.28.2 Test parameters

In this set of test case the cells are on different carrier frequencies. Both absolute and relative accuracy of CRS RSRP inter-frequency measurements are tested by using the parameters in Table A.9.1.28.2-1. In this test case, Cell 1 is the PCell and Cell 2 the target cell. The inter frequency measurements are supported by a measurement gap and a DMTC configuation.

Table A.9.1.28.2-1: CRS RSRP TDD—TDD Inter frequency test parameters

		Test	Test 1	
. 4	ameter	Unit	Cell 1	Cell 2
E-UTRA RF Ch	annel Number		1	2
BW _{channel}		MHz	10	10
Special subfranconfiguration Not	ne _{e1}		6	
Linlink-downlink	c configuration Note1		1	
Gap Pattern Id	Comiguration		0	-
gapOffset		ms	9	
DMTC period		ms	-	160
DMTC period o	ffset	ms	-	10
	al occasion duration	ms	-	2
Time offset bet	ween cells	μs	-	3
Measurement b		n_{PRB}	22—2	27
PDSCH Refere channel defined	nce measurement d in A.3.1.1.2		R.0 TDD	-
PDSCH allocat	ion	$n_{\scriptscriptstyle PRB}$	13—36	-
PDCCH/PCFIC				_
Reference mea defined in A.3.1	surement channel		R.6 TI	OD
OCNG Patterns				
A.3.2.2.1 (OP.1			OP.1 TDD	OP.2
A.3.2.2.2 (OP.2 TDD)				TDD
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA PCFICH RB				
PHICH RA				
PHICH_RB		dB	0	0
PDCCH_RA		4.2		
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA ^{Note2}				
OCNG_RB ^{Note2}				
Note3	Bands TDD_A		(N_{oc} for	-115
$N_{oc}^{ m Note3}$	Bands TDD_C	dBm/15 kHz	Channel 2	-114
	Bands TDD_E		+6dB)	-113
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$		dB	13	-6
	Bands TDD_A		(RSRP for	-121
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	Cell 2	-120
Bands TDD_E			+25dB)	-119
	Bands TDD_A		(lo for	-86.25
Io ^{Note4}	Io ^{Note4} Bands TDD_C		Channel 2	-85.25
	Bands TDD_E		+19.68dB)	-84.25
\hat{E}_s/N_{oc}		dB	13	-6
Propagation co		-	AWG	
Note 1: For s	special subframe and	unlink-downlink	onfigurations	202

For special subframe and uplink-downlink configurations see Note 1: Tables 4.2-1 and 4.2-2 in TS 36.211.

OCNG shall be used such that both cells are fully allocated and Note 2: a constant total transmitted power spectral density is achieved for all OFDM symbols.

Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and Note 3:

shall be modelled as AWGN of appropriate power for $N_{\it oc}$ to be fulfilled.

Note 4:	RSRP and lo levels have been derived from other parameters for
	information purposes. They are not settable parameters
	themselves.
Note 5:	RSRP minimum requirements are specified assuming
	independent interference and noise at each receiver antenna
	port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	DMTC is provided to the UE in the measDS-Config (in
	TS36.331) before the beginning of test
	1 330.331) before the beginning of test

A.9.1.28.3 Test Requirements

The CRS RSRP measurement accuracy shall fulfil the requirements in sections 9.1.14.2.

A.9.1.29 FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

A.9.1.29.1 Test Purpose and Environment

The purpose of this test is to verify that the CSI- RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.14.3 for FDD intra frequency measurements.

A.9.1.29.2 Test parameters

In this set of test case all cells are on the same carrier frequencies. Both absolute and relative accuracy of CSI- RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.29.2-1. In this test case, Cell 1 is the PCell and Cell 2 the target cell. The intra frequency measurements are supported by a DMTC configuration.

Table A.9.1.29.2-1: CSI-RSRP FDD Intra frequency test parameters

	T T T			
Par	ameter	Unit	Tes	
E LITERA DE OL			Cell 1	Cell 2
	E-UTRA RF Channel Number		1	
BW _{channel}		MHz	1	
DMTC period	"	ms	16	
DMTC period o		ms	1	
	al occasion duration	ms	1	
CSI-RS resource			2	4
CSI-RS periodi		ms	1	
CSI-RS subfrar		ms	C	
CSI-RS individu	ual offset[2]	dB	0	0
CSI-RS muting			Enable	Enable
Time offset bet	ween cells	μs	-	2.3
Measurement b		$n_{{\it PRB}}$	22–	-27
PDSCH Refere channel defined	nce measurement d in A.3.1.1.1		R.0 FDD	-
PDSCH allocat	ion	$n_{\it PRB}$	13—36	-
PDCCH/PCFIC Reference mea defined in A.3.1	surement channel		R.6 I	FDD
OCNG Patterns A.3.2.1.1 (OP.1 A.3.2.1.2 (OP.2	FDD) and		OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB OCNG_RB Note1 p-C-r10[2] CRS Ê_s/I_ot	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H	dB dB dBm/15 kHz	6 1: 11 1: 1: 1: 0.46	5.5 15 4.5 14 13
		aR	0.46	-5.76
CSI-RS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	6.46	0.24
RSRP ^{Note3}	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H	dBm/15 kHz	-113 -112.5 -112 -111.5 -111 -110 -109.5	-117 -116.5 -116 -115.5 -115 -114 -113.5
CSI-RSRP Note3	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D	dBm/15 kHz	(RSRP for Cell 1 +6dB)	(RSRP for Cell 2 +6dB)

		T	1	
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
	Bands FDD_A		-82	.43
	Bands FDD_B		-81	.93
	Bands FDD_C		-81	.43
Nervo	Bands FDD_D		-80	.93
Io ^{Note3}	Bands FDD_E, FDD_F Note 5	dBm/9 MHz	-80	.43
	Bands FDD_G Note 7		-79	.43
	Bands FDD_H		-78	.93
CRS \hat{E}_{s}	CRS \hat{E}_s/N_{oc}		3	-1
CSI-RS	CSI-RS \hat{E}_s/N_{oc}		9	5
Propagation condition - AWGN			GN	
Note 1: Note 2:	constant total transmitted power spectral density is achieved for all OFDM symbols.			
Note 3:	information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of			
measurement subframe. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna			ntenna	
Note 5:	port. Step 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz.			
Note 6:	3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 -			
Note 7:	lote 7: Except Band 29 and Band 32.			
Note 8:	·			

A.9.1.29.3 Test Requirements

The CSI- RSRP measurement accuracy shall fulfil the requirements in sections 9.1.14.3.

A.9.1.30 TDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

A.9.1.30.1 Test Purpose and Environment

The purpose of this test is to verify that the CSI- RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.14.3 for TDD intra frequency measurements.

A.9.1.30.2 Test parameters

In this set of test case all cells are on the same carrier frequencies. Both absolute and relative accuracy of CSI- RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.30.2-1. In this test case, Cell 1 is the PCell and Cell 2 the target cell. The intra frequency measurements are supported by a DMTC configuation.

Table A.9.1.30.2-1: CSI-RSRP TDD Intra frequency test parameters

Parameter					
	Pa	rameter	Unit		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	F-UTRA RE C	hannel Number			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BW _{channel}			10	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Special subfram	e configurationNote1		6	3
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Uplink-downlink	configuration Note1		1	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			ms	16	60
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	DMTC period	offset	ms	1	0
CSI-RS subframe offset	Discovery sign	al occasion duration	ms	2)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CSI-RS resour	ce configuration		2	4
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CSI-RS period	licity	ms	1	0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CSI-RS subfra	me offset	ms	C)
$\begin{array}{ c c c c c c }\hline \text{Time offset between cells} & \mus & - & 2.3\\\hline \text{Measurement bandwidth} & n_{PRB} & 22-27\\\hline \text{PDSCH Reference measurement channel defined in A.3.1.1.1} \\\hline \text{PDSCH allocation} & n_{SCH} & 13-36\\\hline \text{PDCH/PCFICH/PHICH} \\\hline \text{Reference measurement channel defined in A.3.1.2.1} \\\hline \text{OCNG Patterns defined in A.3.2.2.1} & OP.1\\\hline \text{OCNG Patterns defined in A.3.2.2.2} & (OP.2 TDD)\\\hline \text{PBCH_RA} \\\hline \text{PBCH_RB} \\\hline \text{PSS RA} \\\hline \text{SSS_RA} \\\hline \text{PCFICH_RB} \\\hline \text{PICH_RB} \\\hline \text{PDCCH_RB} \\\hline \text{PDCCH_RA} \\\hline \text{PDCCH_RA} \\\hline \text{PDCCH_RB} \\\hline \text{DCNG_RA}^{Note1} \\\hline \text{OCNG_RB}^{Note1} \\\hline \text{OCNG_RB}^{Note1} \\\hline \text{OCNG_RB}^{Note1} \\\hline \text{OCNG_RB}^{Note1} \\\hline \text{OCNG_RB}^{Note1} \\\hline \text{OCNG_RB}^{Note1} \\\hline \text{OCNG_RB}^{Note2} \\\hline \text{DCSH_RS} \\\hline \text{Bands TDD_C} \\\hline B$			dB		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				Enable	
PDSCH Reference measurement channel defined in A.3.1.1.1	Time offset be	tween cells	μs	-	2.3
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			$n_{{\scriptscriptstyle PRB}}$	22–	-27
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				R.0 TDD	-
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			$n_{{\scriptscriptstyle PRB}}$	13—36	-
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Reference mea	asurement channel		R.6	TDD
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				OP.1	OP.2
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				TDD	TDD
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		עטט)			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	_				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				0	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			dB		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		1			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	OCNG RB ^{Note}	1			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			dB	6	6
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Bands TDD A	-	-1 ⁻	16
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	N_{aa}^{Note3}		dBm/15 kHz		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	OC .				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	${\sf CRS}\hat{E}_{_{s}}/I_{_{ot}}$		dB	0.46	-5.76
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CSI-RS \hat{E}_{s}/I_{s}	ot	dB	6.46	0.24
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Bands TDD_A		-113	-117
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	RSRP ^{Note3}		dBm/15 kHz	-112	-116
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				-111	-115
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		Bands TDD_A			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CSI-RSRP Note3		dBm/15 kHz		for Cell 2
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$,
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			dBm/9 MHz		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			GDITI/O IVII IZ		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			15		
Propagation condition - AWGN				3	-1
			dB	_	
			unlink-downlink		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a

	constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in
	the test is assumed to be constant over subcarriers and time and
	N _a
	shall be modelled as AWGN of appropriate power for $^{N_{oc}}$ to be
	fulfilled.
Note 4:	RSRP and lo levels have been derived from other parameters for
	information purposes. They are not settable parameters
	themselves. Io levels are calculated in CRS symbols of
	measurement subframe.
Note 5:	RSRP minimum requirements are specified assuming
Note 5.	
	independent interference and noise at each receiver antenna
	port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	DMTC is provided to the UE in the measDS-Config (in TS36.331) before
1	the beginning of the test.

A.9.1.30.3 Test Requirements

The CSI- RSRP measurement accuracy shall fulfil the requirements in sections 9.1.14.3.

A.9.1.31 FDD—FDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

A.9.1.31.1 Test Purpose and Environment

The purpose of this test is to verify that the CSI-RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.14.3 for FDD—FDD inter frequency measurements.

A.9.1.31.2 Test parameters

In this set of test case the cells are on different carrier frequencies. Both absolute and relative accuracy of CSI-RSRP inter-frequency measurements are tested by using the parameters in Table A.9.1.31.2-1. In this test case, Cell 1 is the PCell and Cell 2 the target cell. The inter frequency measurements are supported by a measurement gap and two DMTC configurations which one is for cell1 and the other is for cell2.

Table A.9.1.31.2-1: CSI-RSRP FDD—FDD Inter frequency test parameters

Banani dan		Test 1		st 1
	ameter	Unit	Cell 1	Cell 2
E-UTRA RF Ch	annel Number		1	2
BW _{channel}		MHz	10	10
Gap Pattern Id		ma	0	-
gapOffset DMTC period		ms ms	9 160	160
DMTC period o	ffset	ms	0	100
	al occasion duration	ms	1	1
	ce configuration		2	4
CSI-RS periodi	city	ms	1	0
CSI-RS subfrar		ms	()
CSI-RS individu		dB	0	0
CSI-RS muting			Enable	Enable
Time offset bet		μs	-	3
Measurement b		n_{PRB}	22-	–27
channel defined	nce measurement d in A.3.1.1.1		R.0 FDD	-
PDSCH allocat		n_{PRB}	13—36	-
defined in A.3.1	surement channel .2.1		R.6	FDD
OCNG Patterns A.3.2.1.1 (OP.1 A.3.2.1.2 (OP.2	FDD) and		OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB OCNG_RB		dB	0	0
p-C-r10[2]		dB	0	6
$N_{oc}^{$	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H	dBm/15 kHz	(N_{oc} for Channel 2 +6dB)	-115 -114.5 -114 -113.5 -113 -112 -111.5
${\sf CRS}\hat{E}_{_{\sf s}}/I_{_{\sf ot}}$		dB	13	-6
CSI-RS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	13	0
RSRP ^{Note3}	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H	dBm/15 kHz	(RSRP for Cell 2 +25dB)	-121 -120.5 -120 -119.5 -119 -118

	Bands FDD_A	dBm/15 kHz	(RSRP for Cell 1	(RSRP for Cell 2	
	Bands FDD B		+0dB)	+6dB)	
	Bands FDD_B				
OOL DODD Note3	Bands FDD_C				
CSI-RSRP Note3					
	Bands FDD_E, FDD_F Note 5				
	Bands FDD_G Note 7				
	Bands FDD_H				
	Bands FDD_A			-86.25	
	Bands FDD_B			-85.75	
	Bands FDD_C			-85.25	
	Bands FDD_D		(lo for	-84.75	
lo ^{Note3}	Bands FDD_E, FDD_F Note 5	dBm/9 MHz	Channel 2 +19.68dB)	-84.25	
	Bands FDD_G Note 7			-83.25	
	Bands FDD_H			-82.75	
$\operatorname{CRS} \hat{E}_{s} / N_{oc}$	CRS \hat{E}_s/N_{oc}		13	-6	
CSI-RS \hat{E}_s/N	CSI-RS \hat{E}_s/N_{oc}		13	0	
Propagation cond	dition	- AWGN			
	IG shall be used such tant total transmitted				
all O Note 2: Inter the t	FDM symbols. ference from other coest is assumed to be	ells and noise so constant over so	urces not sp ubcarriers an	ecified in	
Note 3: RSR infor	shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of				
measurement subframe. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.					
Note 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz.					
	ΓRA operating band (groups are as de	fined in Sect	ion 3.5.	
Note 7: Except Band 29 and Band 32.					
	C is provided to the UE eginning of the test	in the <i>measDS-C</i>	onfig (in TS36	.331) before	

A.9.1.31.3 Test Requirements

The CSI-RSRP measurement accuracy shall fulfil the requirements in sections 9.1.14.3.

A.9.1.32 TDD—TDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

A.9.1.32.1 Test Purpose and Environment

The purpose of this test is to verify that the CSI-RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.14.3 for TDD—TDD inter frequency measurements.

A.9.1.32.2 Test parameters

In this set of test case the cells are on different carrier frequencies. Both absolute and relative accuracy of CSI-RSRP inter-frequency measurements are tested by using the parameters in Table A.9.1.32.2-1. In this test case, Cell 1 is the PCell and Cell 2 the target cell. The inter frequency measurements are supported by a measurement gap and two DMTC configurations which one is for cell 1 and the other is for cell2.

Table A.9.1.32.2-1: CSI-RSRP TDD—TDD Inter frequency test parameters

Par	Parameter		Test 1	
		Unit	Cell 1	Cell 2
E-UTRA RF Channel Number		N 41 1-	1	2
BW _{channel} Special subfran	20	MHz	10	10
configuration Not	e1		6	
Uplink-downlink	configuration Note1		1	
Gap Pattern Id	garaman		0	-
gapOffset		ms	9	
DMTC period		ms	160	160
DMTC period o		ms	0	10
	al occasion duration	ms	2	2
CSI-RS resource		ms	10	· ·
CSI-RS subfrar		ms	0	'
CSI-RS individu		dB	0	0
CSI-RS muting	h J		Enable	Enable
Time offset bety	ween cells	μs	-	3
Measurement b	andwidth	$n_{\scriptscriptstyle PRB}$	22—	27
PDSCH Refere channel defined	nce measurement d in A.3.1.1.2		R.0 TDD	-
PDSCH allocati	on	n_{PRB}	13—36	-
PDCCH/PCFIC Reference mea defined in A.3.1	surement channel		R.6 T	DD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA ^{Note2} OCNG_RB ^{Note2}		dB	0	0
p-C-r10[2]	Ι	dB	0	6
N-1-0	Bands TDD_A		(N_{oc} for	-115
$N_{oc}^{ m Note3}$	Bands TDD_C	dBm/15 kHz	Channel 2	-114
	Bands TDD_E		+6dB)	-113
${\sf CRS}\hat{\sf E}_{\sf s}/{\sf I}_{\sf ot}$		dB	13	-6
CSI-RS \hat{E}_{s}/I_{ot}		dB	13	0
	Bands TDD_A		(RSRP for	-121
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	Cell 2	-120
	Bands TDD_E		+25dB)	-119
	Bands TDD_A		(0000 ((DCDD
CSI-RSRP Bands TDD_C Bands TDD_E			(RSRP for Cell 1 +0dB)	(RSRP for Cell
				2 +6dB)
				06.05
lo ^{Note4}	Bands TDD_A	ID (0.1	(lo for	-86.25
10	Bands TDD_C	dBm/9 MHz Channel 2 +19.68dB)		-85.25
	Bands TDD_E		. 10.00db)	-84.25

${\sf CRS}\hat{E}_s$ /	N_{oc}	dB	13	-6
CSI-RS	\hat{E}_s/N_{oc}	dB	13	0
Propagat	ion condition	-	AWG	N
Note 1:	For special subframe and Tables 4.2-1 and 4.2-2 in		onfigurations	see
Note 2:	OCNG shall be used such constant total transmitted all OFDM symbols.		,	
Note 3: Interference from other cells and noise sources not specified i the test is assumed to be constant over subcarriers and time a			time and	
Note 4:	information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of			
Note 5:	measurement subframe. 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.			enna
Note 6: Note 7:	ote 6: E-UTRA operating band groups are as defined in Section 3.5.			

A.9.1.32.3 Test Requirements

The CSI-RSRP measurement accuracy shall fulfil the requirements in sections 9.1.14.3.

A.9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal

A.9.1.33.1 Test Purpose and Environment

The purpose of this test is to verify that the FDD RSRP absolute and relative measurement accuracies in carrier aggregation in CRS based discovery signal are within the specified limits. This test will verify the absolute RSRP accuracy requirement of the secondary component carrier defined in clause 9.1.15.1.2, and the relative RSRP accuracy requirement of the secondary component carrier defined in clause 9.1.15.1.2. The test will also verify the primary and secondary component carrier relative RSRP accuracy requirement defined in Clause 9.1.15.1.3.

A.9.1.33.2 Test parameters

In this test case, Cell1 is PCell on the primary component carrier, Cell2 is SCell on the secondary component carrier and activated, and Cell3 is the neighboring cell on the secondary component carrier. The test parameters are given in Table A.9.1.33.2-1. The Cell 3 DMTC configuration is provided to the UE in the *measDS-Config* before the start of the test.

Table A.9.1.33.2-1: RSRP FDD carrier aggregation test parameters

Par	ameter	Unit	Test 1		
		Offic	Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
BW _{channel}		MHz	10	10	10
DMTC period	tto at	ms	N/A	N/A	160
DMTC period o	al occasion duration	mo	N/A N/A	N/A N/A	10 1
Timing offset to		ms	IN/A	0	3
Tilling onset to	Cell I	μs	-	≤ Time	3
Time alignment error between cell 2 and cell 1			-	alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement b		$n_{\it PRB}$		22—27	
PDSCH Refere channel defined	nce measurement d in A.3.1.1.1		R.0 FDD	R.0 FDD	-
PDSCH allocati	-	n_{PRB}	13—36	13—36	-
defined in A.3.1	surement channel .2.1			R.6 FDD	
OCNG Patterns A.3.2.1.1 (OP.1 A.3.2.1.2 (OP.2	FDD) and		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote		dB	0	0	0
Bands FDD_A Bands FDD_B Bands FDD_C Noc Note2 Bands FDD_D Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_G Bands FDD_H		dBm/15 kHz	-117 -116.5 -116 -115.5 -115 -114 -113.5	(N_{oc} for Channel 1 +1dB)	
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	-4	0.46	-5.76
RSRP ^{Note3}	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_G Bands FDD_H	dBm/15 kHz	-121 -120.5 -120 -119.5 -119 -118 -117.5	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
Io ^{Note3}	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6	dBm/9 MHz	-87.76 -86.26 -86.76 -86.26 -85.76	(lo for Channel 1 +5.33	

	Bands FDD_G		-84.76				
	Bands FDD_H		-84.26				
\hat{E}_s/N_{oc}		dB	-4	3	-1		
Propagati	ion condition	-		AWGN			
Note 1:	OCNG shall be used such				tant total		
	transmitted power spectra						
Note 2:	Interference from other co to be constant over subca						
	appropriate power for $N_{ m c}$	$_{c}$ to be fulfilled.					
Note 3:	RSRP and lo levels have	been derived from other parameters for information					
	purposes. They are not se	ettable parameters	themselves.				
Note 4:	RSRP minimum requirem	•	assuming ind	dependent inte	erference and		
	noise at each receiver an						
Note 5:	The selection of the band	• .	nds on the co	nfiguration of t	he carrier		
Note C.	aggregation supported by		و المام و والم والماء		41		
Note 6:	E-UTRA channel bandwic	all be performed with the carrier frequency of the assigned					
Note 7:		A requirement which is independent of channel bandwidth					
14010 7.	and is performed according				, ballawiati		
Note 8:	E-UTRA operating band o						

A.9.1.33.3 Test Requirements

In the test, the performance of RSRP measurements is verified from following three perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 3 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.15.1.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.15.1.2
- The relative accuracy of inter-frequency RSRP measurements between the primary and secondary component carriers for Cell 3 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.15.1.3.

A.9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal

A.9.1.34.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD RSRP absolute and relative measurement accuracies in carrier aggregation in CRS based discovery signal are within the specified limits. This test will verify the absolute RSRP accuracy requirement of the secondary component carrier defined in clause 9.1.15.1.2, and the relative RSRP accuracy requirement of the secondary component carrier defined in clause 9.1.15.1.2. The test will also verify the primary and secondary component carrier relative RSRP accuracy requirement defined in Clause 9.1.15.1.3.

A.9.1.34.2 Test parameters

In this test case, Cell1 is PCell on the primary component carrier, Cell2 is SCell on the secondary component carrier and activated, and Cell3 is the neighboring cell on the secondary component carrier. The test parameters are given in Table A.9.1.34.2-1. The Cell 3 DMTC configuration is provided to the UE in the *measDS-Config* before the start of the test.

Table A.9.1.34.2-1: Carrier aggregation RSRP test parameters for TDD

P:	arameter	Unit		Test 1	
		Onne	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
BW _{channel}		MHz	10	10	10
DMTC period		ms	N/A	N/A	160
DMTC period offset			N/A	N/A	10
Discovery signal occ	casion duration	ms	N/A	N/A	2
Special subframe co	onfiguration Note1			6	
Uplink/downlink con	figuration			1	
Timing offset to Cell	1	μs	-	0	3
Time alignment erro	r between cell 2 and cell 1		-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1	-
Measurement bandy	width	n_{PRB}		22—27	
PDSCH Reference r defined in A.3.1.1.2	measurement channel		R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/Ph	HICH Reference nel defined in A.3.1.2.2		R.6 TDD		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB OCNG_RB	Bands TDD_A	dB	-117	0	0
$N_{oc}^{ m Note3}$	Bands TDD_C Bands TDD_E	dBm/15 kHz	-116 -115	(N_{oc} for (
$\hat{ extbf{E}}_{ ext{s}}/ extbf{I}_{ ext{ot}}$		dB	-4	0.5	-5.76
RSRP ^{Note4}	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-121 -120 -119	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
Io ^{Note4}	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/9 MHz	-87.76 -86.76 -85.76	(lo for Cl +5.3	
\hat{E}_s/N_{oc}		dB	-4	3	-1
E_s/W_{oc}		u.b	-	· ·	· ·

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power

for ^{IV}oc to be fulfilled.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes.

		They are not settable parameters themselves.
1	Note 5:	RSRP minimum requirements are specified assuming independent interference and noise
		at each receiver antenna port.
1	Note 6:	The selection of the bands for testing depends on the configuration of the carrier
		aggregation supported by the UEs.
1	Note 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is
		performed according to the principle defined in section A.3.6.1.
١	Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.34.3 Test Requirements

In the test, the performance of RSRP measurements is verified form following three perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 3 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.15.1.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.15.1.2
- The relative accuracy of inter-frequency RSRP measurements between the primary and secondary component carriers for Cell 3 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.15.1.3.

A.9.1.35 FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal

A.9.1.35.1 Test Purpose and Environment

The purpose of this test is to verify that the FDD CSI-RSRP absolute and relative accuracy requirements in carrier aggregation are within the specified limits. This test will verify the absolute CSI-RSRP accuracy requirements of the primary component carrier defined in clause 9.1.15.2.1, the absolute CSI-RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.15.2.2, and the relative CSI-RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.15.2.2. The test will also verify the primary and secondary component carrier relative CSI-RSRP accuracy requirement defined in Clause 9.1.15.2.3.

A.9.1.35.2 Test parameters

In this set of cases cell1 is PCell on the primary component carrier, cell2 is SCell on the secondary component carrier and activated, and cell3 is the neighboring cell on the secondary component carrier. The test parameters are given in Table A.9.1.35.2-1. This set is supported by two DMTC configurations which one is for cell1 and the other is for cell2 and cell3.

Table A.9.1.35.2-1: CSI-RSRP FDD carrier aggregation test parameters

Pai	rameter	Unit	Test 1		
		Offic	Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
BW _{channel}	11.4	MHz	10	10	10 3
Timing offset to cell1 Time alignment error between cell 2 and cell 1		μѕ	-	0 ≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause	-
DIATO : I			100	6.5.3.1.	
DMTC period	"	ms	160		60
DMTC period o		ms	0	1	10
	al occasion duration	ms	2	4	1
	ce configuration		10	4	6
CSI-RS periodi		ms	0	10 0	10
CSI-RS individu		ms dB	0	0	0
CSI-RS muting		иь	Enable	Enable	Enable
			Lilable		Lilable
Measurement b	ence measurement	n_{PRB}		22—27	-
channel defined	d in A.3.1.1.1		R.0 FDD	R.0 FDD	
PDSCH allocat		$n_{{\it PRB}}$	13—36	13—36	-
PDCCH/PCFIC Reference mea defined in A.3.1	surement channel			R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RA PDSCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote		dB	0	0	0
p-C-r10[2]	Danda EDD A	ав		ь	Ь
Bands FDD_A Bands FDD_B Bands FDD_C Noc Note2 Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_G Bands FDD_H		dBm/15 kHz	-117 -116.5 -116 -115.5 -115 -114 -113.5	N_{oc} for Channel 1 +10 N_{oc}	
${\sf CRS}\hat{E}_{_s}/{ m I}_{_{ m ot}}$		dB	-4	0.46	-5.76
CSI-RS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	2	6.46	0.24
RSRP ^{Note3}	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6	dBm/15 kHz	-121 -120.5 -120 -119.5 -119	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)

Bands FDD_G

-118

		Bands FDD_H		-117.5			
		Bands FDD_A		-115			
	Bands FDD_B	1	-114.5				
		Bands FDD_C		-114	(CSI-	(CCL DCDD	
	CSI-	Bands FDD_D	dBm/15 kHz	-113.5	RSRP for	(CSI-RSRP for Cell 1 +4dB)	
	RSRP ^{Note3}	Bands FDD_E, FDD_F Note 6	UDIII/13 KHZ	-113	Cell 1 +8dB)		
		Bands FDD_G		-112			
		Bands FDD_H		-111.5			
		Bands FDD_A		-87.76			
		Bands FDD_B		-87.26			
		Bands FDD_C		-86.76			
	Io ^{Note3}	Bands FDD_D	dBm/9 MHz	-86.26	(la far Chann	ol 1 . F 22dD)	
	10	Bands FDD_E, FDD_F Note 6	UDIII/9 IVITZ	-85.76	(10 for Chanr	nel 1 +5.33dB)	
		Bands FDD_G		-84.76			
		Bands FDD_H		-84.26			
	$\operatorname{CRS} \hat{E}_s /$	N_{oc}	dB	-4	3	-1	
	CSI-RS \hat{E}	S_s/N_{oc}	dB	2	9	5	
	Propagation	on condition	-		AWGN		
	Note 1:	OCNG shall be used such	that both cells are fully allocated and a constant total				
			Il density is achieved for all OFDM symbols.				
	Note 2:		ells and noise sources not specified in the test is assumed arriers and time and shall be modelled as AWGN of				
		to be constant over subca					
		appropriate power for N_{o}	$_{c}$ to be fulfilled.				
	Note 3:		been derived from other parameters for information				
			settable parameters themselves. Io levels are calculated in				
		CRS symbols of measure					
	Note 4:	RSRP minimum requirem	•	assuming in	dependent inte	rference and	
noise at each receiver ar				da an tha an	nfiguration of t	ha aarriar	
Note 5: The selection of the bands for testing depends on the co					inguration of t	ne camer	
	Note 6:	aggregation supported by		ith the cerrie	r fraguanay of	the engianed	
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assign E-UTRA channel bandwidth within 865-894 MHz.					ille assigned		
					dent of channe	l handwidth	
	Note 7:	This test verifies the RRM and is performed according	requirement which	ch is independ		I bandwidth	

A.9.1.35.3 Test Requirements

beginning of the test.

Note 8:

Note9:

In the test, the performance of CSI-RSRP measurements is verified from following four perspectives:

E-UTRA operating band groups are as defined in Section 3.5.

- The absolute accuracy of intra-frequency CSI-RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.15.2.1.

DMTC configurations are provided to the UE in the measDS-Config (in TS36.331) before the

- The absolute accuracy of intra-frequency CSI-RSRP measurements for Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.15.2.2.
- The relative accuracy of intra-frequency CSI-RSRP measurements for Cell 3 relative to Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.15.2.2.
- The relative accuracy of inter-frequency CSI-RSRP measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.15.2.3.

A.9.1.36 TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal

A.9.1.36.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD CSI-RSRP absolute and relative accuracy requirements in carrier aggregation are within the specified limits. This test will verify the absolute CSI-RSRP accuracy requirements of the primary component carrier defined in clause 9.1.15.2.1, the absolute CSI-RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.15.2.2, and the relative CSI-RSRP accuracy requirements of the secondary component carrier defined in clause 9.1.15.2.2. The test will also verify the primary and secondary component carrier relative CSI-RSRP accuracy requirement defined in Clause 9.1.15.2.3.

A.9.1.36.2 Test parameters

In this set of cases cell1 is PCell on the primary component carrier, cell2 is SCell on the secondary component carrier and activated, and cell3 is the neighboring cell on the secondary component carrier. The test parameters are given in Table A.9.1.36.2-1. This set is supported by two DMTC configurations which one is for cell1 and the other is for cell2 and cell3.

Table A.9.1.36.2-1: CSI-RSRP TDD carrier aggregation test parameters

		I	I	T14	
P	arameter	Unit	Cell 1	Test 1 Cell 2	Cell 3
E LITEA DE Chann	al Number		Cell 1		Cell 3
BW _{channel}	E-UTRA RF Channel Number		ı	10	<u> </u>
Special subframe co	onfiguration Note1	MHz		6	
Uplink/downlink cor	offiguration Note1			1	
Timing offset to Cel		110		0	3
Tilling onset to Cel	1 1	μs	-	≤ Time	3
				alignment error as	
Time alignment erro	or between cell 2 and cell 1		-	specified in 3GPP TS 36.104	-
				[30] clause 6.5.3.1	
DMTC period		ms	160		60
DMTC period offset		ms	0		0
Discovery signal oc		ms	2	2	2
CSI-RS resource co	onfiguration		2	4	6
CSI-RS periodicity		ms	10	10	10
CSI-RS subframe o		ms	0	0	0
CSI-RS individual o	ffset[2]	dB	0	0	0
CSI-RS muting			Enable	Enable	Enable
Measurement band	width measurement channel	n_{PRB}		22—27	
defined in A.3.1.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PI measurement chan	HICH Reference nel defined in A.3.1.2.2		R.6 TDD		
	fined in A.3.2.2.1 (OP.1		OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA					
PBCH_RB PSS_RA		-			
SSS_RA		-			
PCFICH_RB		-			
PHICH_RA		-			
PHICH RB		dB	0	0	0
PDCCH RA		ub.	U	U	U
PDCCH_RB					
PDSCH_RA		1			
PDSCH_RB		1			
OCNG_RA ^{Note2}		1			
OCNG_RB ^{Note2}		1			
p-C-r10[2]		dB	6	6	6
	Bands TDD_A	42	-117		
$N_{oc}^{ m Note3}$	Bands TDD_C	dBm/15 kHz	-116	(N_{oc} for	Channel 1
OC	Bands TDD_E	1	-115	+10	dB)
${\sf CRS}\hat{\sf E}_{_{ m s}}/{\sf I}_{_{ m ot}}$		dB	-4	0.46	-5.76
CSI-RS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	2	6.46	0.24
	Bands TDD_A		-121	(RSRP for	(RSRP for
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-120	Cell 1	Cell 1
	Bands TDD_E	1	-119	+8dB)	+4dB)
	Bands TDD_A		-115	(CSI-	(CSI-
CSI-RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-114	RSRP for	RSRP for
OOI-NONF	Bands TDD_E	UDIII/ 10 KHZ	-113	Cell 1 +8dB)	Cell 1 +4dB)
Bands TDD_A			-87.76	,	,
Io ^{Note4}	Bands TDD_C	dBm/9 MHz	-86.76	(Io for Channel 1 +5.33dB)	
	Bands TDD_E	1	-85.76	+5.3	saB)
-					

CRS \hat{E}_{s} /	N_{oc}	dB	-4	3	-1	
CSI-RS I	\hat{z}_s/N_{oc}	dB	2	9	5	
Propagat	ion condition	-		AWGN		
Note 1:	For special subframe and uplink-down 36.211.	nlink configuration	ons see Table	es 4.2-1 and 4	1.2-2 in TS	
Note 2:	OCNG shall be used such that both of power spectral density is achieved for			constant total	transmitted	
Note 3:	Interference from other cells and nois constant over subcarriers and time ar					
	for N_{oc} to be fulfilled.					
Note 4:	RSRP and lo levels have been derive They are not settable parameters the measurement subframe.					
Note 5:	RSRP minimum requirements are speat each receiver antenna port.	ecified assuming	g independen	t interference	and noise	
Note 6:	·					
Note 7:					dth and is	
Note 8:	E-UTRA operating band groups are as de					
Note9:	DMTC configurations are provided to the lof the test	JE in the <i>measDS</i>	S-Config (in TS3	36.331) before	the beginning	

A.9.1.36.3 Test Requirements

In the test, the performance of CSI-RSRP measurements is verified from following four perspectives:

- The absolute accuracy of intra-frequency CSI-RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.15.2.1.
- The absolute accuracy of intra-frequency CSI-RSRP measurements for Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.15.2.2.
- The relative accuracy of intra-frequency CSI-RSRP measurements for Cell 3 relative to Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.15.2.2.
- The relative accuracy of inter-frequency CSI-RSRP measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.15.2.3.

A.9.1.37 3 DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation

A.9.1.37.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD-FDD RSRP absolute and relative accuracy requirements in carrier aggregation with PCell in FDD are within the specified limits. This test will verify the absolute RSRP accuracy requirements of the primary component carrier defined in clause 9.1.11.1, the absolute RSRP accuracy requirements of the secondary component carriers defined in clause 9.1.11.2, and the relative RSRP accuracy requirements of the secondary component carriers defined in clause 9.1.11.2. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement defined in Clause 9.1.11.3.

A.9.1.37.2 Test parameters

In this set of cases cell 1 is PCell on the primary component carrier, and cell 2 and cell 4 are activated SCells on secondary component carriers SCC1 and SCC2 respectively. Cell 3 and cell 5 are neighbouring cells on secondary component carriers SCC1 and SCC2 respectively. The test parameters are given in Table A.9.1.37.2-1.

Table A.9.1.37.2-1: 3 Downlink PCell in FDD RSRP carrier aggregation test parameters

	ameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	
E-UTRA RF	Channel Number		1	2			3	
BW _{channel}		MHz	$5 \text{MHz:} \\ N_{\text{RB,c}} = 25 \\ 10 \text{MHz:} \\ N_{\text{RB,c}} = 50 \\ 20 \text{MHz:} \\ N_{\text{RB,c}} = 100$	10MHz: N	5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100		5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100	
Special subfi	ame		-	6			6	
configuration Uplink/downl	ink		-	1			1	
Measuremer		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10MHz: 20MHz:	22-27	10MH; 20MH;	: 10-15 z: 22-27 z: 47-52	
PDSCH Refe measuremer defined in A.	nt channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-	
PDSCH alloc	cation	$n_{_{PRB}}$	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7- 17 10MHz: 13-36 20MHz: 38-61	-	
PDCCH/PCF Reference m channel defir			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	
OCNG Patte A.3.2.	rns defined in		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.7 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	
PBCH_RA								
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB		dB	0	0	0	0	0	
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB	ste?							
OCNG_RANG								
OCNG_RB ^{No}	Bands TDD_A Bands TDD_C		-	(N_{oc} for Cha	nnel 1 +1dB)		Channel 1 dB)	
	Bands TDD_E Bands FDD_A		-117			71	~ <i>D</i>)	
	Bands FDD_B	dBm/15	-116.5]				
$N_{oc}^{ m Note3}$	Bands FDD_C	kHz	-116 115.5	-				
	Bands FDD_D Bands FDD_E, FDD_F Note 7		-115.5 -115	-			-	
	Bands FDD_G Bands FDD_H		-114 -113.5	1				
\hat{E}_s/N_{oc}		dB	-4	3	-1	3	-1	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-4	0.46	-5.76	0.46	-5.76	
	Bands TDD_A		-	(RSRP for Cell	(RSRP for	(RSRP for	(RSRP for	

	Bands TDD_C Bands TDD_E			1 +8dB)	Cell 1 +4dB)	Cell 1 +8dB)	Cell 1 +4dB)
	Bands FDD_A		-121				
RSRP ^{Note4}	Bands FDD_B	dBm/15	-120.5				
	Bands FDD_C	kHz	-120				
	Bands FDD_D		-119.5				
	Bands			=	-	-	-
	FDD_E, FDD_F Note 7		-119				
	Bands FDD_G		-118				
	Bands FDD_H		-117.5				
	Bands TDD_A			(Io for Channe	el 1 +5.33dB	(Io for Chan	nel 1 +5.33dB
	Bands TDD_C		-	+10	log	+1	0log
	Bands TDD_E			(N _{RB channel2} /	N _{RB channel 1}))	(N _{RB channel3}	/ N _{RB channel 1}))
	Bands FDD_A		-87.76+10log(N _{RB,o} /50)				
	Bands FDD_B		-87.26+10log(N _{RB,o} /50)				
lo ^{Note4}	Bands FDD_C	dBm/	-86.76+10log(N _{RB,o} /50)				
10	Bands FDD_D	BW _{channel}	-86.26+10log(N _{RB,o} /50)				
	Bands FDD_E, FDD_F Note 7		-85.76 +10log(N _{RB,0} /50)	-			-
	Bands FDD_G		-84.76 +10log(N _{RB,} /50)				
	Bands FDD_H		-84.26 +10log(N _{RB,} /50)				
Propagation		-	AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Cor	•	=	1x2	1x2	1x2	1x2	1x2
Timing offset		μs	-	0	3	0	3
to cell 1 Note 8			-	≤TAE	-	≤TAE	-
Time alignmento cell 2 ^{Note 8}	ent error relative		-	-	-	≤TAE	-
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and							

- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.
- Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves
- Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
- Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 8: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
- Note 9: E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.37.3 Test Requirements

In the test, the performance of RSRP measurements is verified from the following 7 perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 4 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 5 relative to Cell 4 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRP measurements between SCC1 and the primary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.
- The relative accuracy of inter-frequency RSRP measurements between SCC2 and the primary component carriers for Cell 4 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.

A.9.1.38 3 DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation

A.9.1.38.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD-FDD RSRP absolute and relative accuracy requirements in carrier aggregation with PCell in TDD are within the specified limits. This test will verify the absolute RSRP accuracy requirements of the primary component carrier defined in clause 9.1.11.1, the absolute RSRP accuracy requirements of the secondary component carriers defined in clause 9.1.11.2, and the relative RSRP accuracy requirements of the secondary component carriers defined in clause 9.1.11.2. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement defined in Clause 9.1.11.3.

A.9.1.38.2 Test parameters

In this set of cases cell 1 is PCell on the primary component carrier, and cell 2 and cell 4 are activated SCells on secondary component carriers SCC1 and SCC2 respectively. Cell 3 and cell 5 are neighbouring cells on secondary component carriers SCC1 and SCC2 respectively. The test parameters are given in Table A.9.1.38.2-1.

Table A.9.1.38.2-1: 3 Downlink PCell in TDD RSRP carrier aggregation test parameters

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5
E-UTRA RF Channel Number		1	:	2		3
BW _{channel}	MHz	$5MHz$: $N_{RB,c} = 25$ $10MHz$: $N_{RB,c} = 50$ $20MHz$: $N_{RB,c} = 100$	10MHz: I	$I_{RB,c} = 25$ $N_{RB,c} = 50$ $I_{RB,c} = 100$	10MHz	$N_{RB,c} = 25$ $N_{RB,c} = 50$ $N_{RB,c} = 100$
Special subframe		6		=		-
configuration ^{Note1} Uplink/downlink configuration ^{Note1}		1		-		-
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	10MHz	: 10-15 :: 22-27 :: 47-52	10MF	z: 10-15 łz: 22-27 łz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1.		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation	$n_{{\scriptscriptstyle PRB}}$	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7- 17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in A.3.2.		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB	dB	0	0	0	0	0
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB	4					
OCNG_RA ^{Note1} OCNG_RB ^{Note1}	1					
Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Noc Note3 Bands FDD_E, FDD_E, Note 7 Bands FDD_G Bands FDD_G Bands FDD_H	dBm/15 kHz	-	(N_{oc} for Ch	annel 1 +1dB)	(N_{oc} for C	hannel 1 +1dB)
Bands TDD_A	1	-117				
Bands TDD_C Bands TDD_E	4	-116 -115	-	-		-
\hat{E}_s/N_{oc}	dB	-115	3	-1	3	-1
s/ roc		7		<u>'</u>		'

$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	-4	0.46	-5.76	0.46	-5.76	
RSRP ^{Note4}	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 7 Bands FDD_G Bands FDD_G Bands FDD_G Bands FDD_H	dBm/15 kHz	-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	
	Bands TDD_A Bands TDD C		-121 -120	_	_	_	_	
	Bands TDD_C		-119	_	_	_	-	
Io ^{Note4}	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 7 Bands FDD_G Bands FDD_G Bands FDD_H Bands TDD_A Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C	dBm/ BW _{channel}	-87.76+10log(N _{RB,e} /50) -86.76+10log(N _{RB,e} /50) -85.76+10log(N _{RB,e} /50)	(Io for Channel 1 +5.33dB +10log (N _{RB channel2} / N _{RB channel 1}))		` +1	nnel 1 +5.33dB 10log / N _{RB channel 1}))	
Propagation	condition	-	AWGN	AWGN	AWGN	AWGN	AWGN	
Antenna Con		-	1x2	1x2	1x2	1x2	1x2	
Timing offset		μs	-	0	3	0	3	
Time alignme to cell 1 Note 8	ent error relative		-	≤TAE	-	≤ TAE	-	
Time alignment error relative to cell 2 ^{Note8}			-	-	-	≤TAE	-	
Note 1: F Note 2: C a Note 3: II	Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

opriate power for $\imath {f v}_{oc}$ to

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5:

The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs. Note 6:

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

E-UTRA operating band groups are as defined in Section 3.5. Note 9:

A.9.1.38.3 Test Requirements

In the test, the performance of RSRP measurements is verified from the following 7 perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 4 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 5 relative to Cell 4 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRP measurements between SCC1 and the primary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3. The relative accuracy

of inter-frequency RSRP measurements between SCC2 and the primary component carriers for Cell 4 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.

A.9.1.39 3 DL FDD RSRP for E-UTRAN in Carrier Aggregation

A.9.1.39.1 Test Purpose and Environment

The purpose of this test is to verify that the FDD RSRP absolute and relative accuracy requirements in carrier aggregation are within the specified limits. This test will verify the absolute RSRP accuracy requirements of the primary component carrier defined in clause 9.1.11.1, the absolute RSRP accuracy requirements of the secondary component carriers defined in clause 9.1.11.2, and the relative RSRP accuracy requirements of the secondary component carriers defined in clause 9.1.11.2. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement defined in Clause 9.1.11.3.

A.9.1.39.2 Test parameters

In this set of test cases there are five cells on three carrier frequencies. Cell 1 is PCell on channel 1, and cell 2 and cell 4 are activated SCells on secondary component carriers SCC1 and SCC2 respectively. Cell 3 and cell 5 are neighbouring cells on secondary component carriers SCC1 and SCC2 respectively. The parameters for the test are listed in Table A.9.1.39.2-1.

Table A.9.1.39.2-1: 3 DL FDD RSRP test parameters for E-UTRAN Carrier aggregation (cell #1, cell #2 and cell #3)

Pa	rameter	Unit	Cell 1	Cell 2	Cell 3	
E-UTRA RF Channel			1	2)	
Number			-			
DIM			$5MHz: N_{RB,c} = 25$	5MHz: N		
BW _{channel}		MHz	10MHz: $N_{RB,c} = 50$	10MHz: N		
 			20MHz: N _{RB,c} = 100 5MHz: 10-15	20MHz: N 5MHz:		
Measureme	ent bandwidth	n_{PRB}	10MHz: 22-27		: 22-27	
		PRB	20MHz: 47-52		: 47-52	
PDSCH Ref	erence		5MHz: R.5 FDD	5MHz: R.5 FDD		
measureme			10MHz: R.0 FDD	10MHz: R.0 FDD	-	
defined in A	3.1.1.1		20MHz: R.4 FDD	20MHz: R.4 FDD		
DDCCH -"		,	5MHz: 7-17	5MHz: 7-17		
PDSCH allo	ocation	n_{PRB}	10MHz: 13-36 20MHz: 38-61	10MHz: 13-36 20MHz: 38-61	-	
PDCCH/PC	FICH/PHICH	 	5MHz: R.11 FDD	5MHz: R.11 FDD	5MHz: R.11 FDD	
	neasurement		10MHz: R.6 FDD	10MHz: R.6 FDD	10MHz: R.6 FDD	
	ined in A.3.1.2.1		20MHz: R.10 FDD	20MHz: R.10 FDD	20MHz: R.10 FDD	
			5MHz: OP.15 FDD	5MHz: OP.15 FDD	5MHz: OP.16 FDD	
	erns defined in		10MHz: OP.15 FDD	10MHz: OP.1 FDD	10MHz: OP.2 FDD	
A.3.2.1			20MHz: OP.11 FDD	20MHz: OP.11	20MHz: OP.12	
DDCU DA		-		FDD	FDD	
PBCH_RA PBCH_RB		 				
PSS_RA		1				
SSS RA		1				
PCFICH_RE	3	1				
PHICH_RA		1			0	
PHICH_RB		dB	0	0		
PDCCH_RA	1]				
PDCCH_RE]				
PDSCH_RA						
PDSCH_RE	Jote1					
OCNG_RAN	lote1					
OCNG_RB ^N			-117			
	Bands FDD_A Bands FDD B	1	-117 -116.5	-		
	Bands FDD_B	1	-116			
λ/ Note2	Bands FDD_D	dBm/	-115.5	(NT		
$N_{oc}^{ m Note2}$	Bands FDD F	15kHz		(N_{oc} for Cha	annei 1 +1aB)	
	FDD_F Note 6]	-115			
	Bands FDD_G]	-114			
	Bands FDD_H		-113.5	1		
\hat{E}_s/N_{oc}		dB	-4	3	-1	
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	-4	0.46	-5.76	
s/ UL	Bands FDD_A	 	-121			
	Bands FDD_B	1	-120.5			
	Bands FDD_C	1	-120			
RSRP ^{Note3}	Bands FDD_D	dBm/	-119.5	(RSRP for Cell 1	(RSRP for Cell 1	
KOKP	Bands FDD_E,	15kHz	-119	+8dB)	+4dB)	
	FDD_F Note 6					
	Bands FDD_G		-118			
	Bands FDD_H		-117.5 -87.76			
	Bands FDD_A		-87.76 +10log(N _{RB,} /50)			
	D	1	-87.26			
	Bands FDD_B	-ID (+10log(N _{RB,c} /50)	(1- 4- 0)	. F 00 JD . 40	
Io ^{Note3}	Bands EDD C	dBm/	-86.76	(lo for Channel 1	•	
	Bands FDD_C	BW _{channel}	+10log(N _{RB,c} /50)	(N _{RB channel2} /	INRB channel 1))	
	Bands FDD_D		-86.26			
			+10log(N _{RB,c} /50)			
	Bands FDD_E,		-85.76			

FDD_F Note 6		+10log(N _{RB,c} /50)		
Bands FDD_G		-84.76 +10log(N _{RB,} √50)		
Bands FDD_H		-84.26 +10log(N _{RB,} /50)		
Propagation Condition		AWGN	AWGN	AWGN
Antenna Configuration		1x2	1x2	1x2
Timing offset to Cell 1	μs	-	0	3
Time alignment error relative to cell 1 Note 7		-	≤TAE	

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
- Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 7: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
- Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table A.9.1.39.2-2: 3 DL FDD RSRP test parameters for E-UTRAN Carrier aggregation (cell #4 and cell #5)

Pa	rameter	Unit	Cell 4	Cell 5		
E-UTRA RF		•				
Number			3			
				RB,c = 25		
BW _{channel}		MHz		$N_{RB,c} = 50$		
			20MHz: N			
Magaurama	nt handwidth	14	_	10-15		
ivieasureme	ent bandwidth	$n_{{\it PRB}}$:: 22-27 :: 47-52		
PDSCH Re	ference		5MHz: R.5 FDD	47-52		
measureme			10MHz: R.0 FDD	-		
defined in A			20MHz: R.4 FDD			
			5MHz: 7-17			
PDSCH allo	ocation	n_{PRB}	10MHz: 13-36	-		
			20MHz: 38-61			
	FICH/PHICH		5MHz: R.11 FDD	5MHz: R.11 FDD		
	measurement		10MHz: R.6 FDD	10MHz: R.6 FDD		
channel del	ined in A.3.1.2.1		20MHz: R.10 FDD 5MHz: OP.15 FDD	20MHz: R.10 FDD 5MHz: OP.16 FDD		
OCNG Patt	erns defined in		10MHz: OP.15 FDD	10MHz: OP.16 FDD		
A.3.2.1	erris defined in		20MHz: OP.11	20MHz: OP.12		
71.0.2.1			FDD	FDD		
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RI						
PHICH_RA						
PHICH_RB		dB	0	0		
PDCCH_RA						
PDCCH_RE						
PDSCH_RA						
PDSCH_RE OCNG_RA	Note1					
OCNG_RB	Note1					
OCNG_KB	Bands FDD_A					
	Bands FDD_A					
	Bands FDD_C					
λ/ Note2	Bands FDD_D	dBm/	. 3.7			
$N_{oc}^{ m Note2}$	Bands FDD_E,	15kHz	(N_{oc} for Channel 1 +1dB)			
	FDD_F Note 6					
	Bands FDD_G					
	Bands FDD_H					
\hat{E}_s/N_{oc}		dB	3	-1		
\hat{E}_s/I_{ot}		dB	0.46	-5.76		
s / OI	Bands FDD_A					
	Bands FDD_A Bands FDD B					
	Bands FDD_B Bands FDD_C					
Noto?	Bands FDD_C	dBm/	(RSRP for Cell 1	(RSRP for Cell 1		
RSRP ^{Note3}		15kHz	+8dB)	+4dB)		
	Bands FDD_E, FDD_F Note 6					
	Bands FDD_G					
	Bands FDD_H					
	Bands FDD_A					
	Bands FDD_B					
	Bands FDD_C					
Io ^{Note3}	Bands FDD_D	dBm/		+5.33dB +10log		
	Bands FDD_E,	BW _{channel}	(N _{RB channel3} /	N _{RB channel 1}))		
	FDD_F Note 6					
	Bands FDD_G					
	Bands FDD_H					

Propagation Condition		AWGN	AWGN		
Antenna Configuration		1x2	1x2		
Timing offset to Cell 1	μs	0	3		
Time alignment error relative to cell 1 Note 7		≤TAE	-		
Time alignment error relative to cell 2 ^{Note 7}		≤TAE	-		
Note 1: OCNG shall be us	ed such that	both cells are fully alloc	cated and a constant		
Note 2: Interference from	total transmitted power spectral density is achieved for all OFDM symbols. Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled.				
as AWGN of appro	opriate power	for N_{oc} to be fulfilled.			
		derived from other para not settable parameter			
Note 4: RSRP minimum re	equirements a	are specified assuming receiver antenna port.			
	e bands for to	esting depends on the	configuration of the		
Note 6: For Band 26, the t	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.				
Note 7: Time alignment er	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.				
Note 8: E-UTRA operating	band groups	are as defined in Sect	ion 3.5.		

A.9.1.39.3 Test Requirements

In the test, the performance of RSRP measurements is verified form following four perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 4 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 5 relative to Cell 4 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRP measurements between SCC1 and the primary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.
- The relative accuracy of inter-frequency RSRP measurements between SCC2 and the primary component carriers for Cell 4 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.

A.9.1.40 3 DL TDD RSRP for E-UTRAN in Carrier Aggregation

A.9.1.40.1 Test Purpose and Environment

The purpose of this test is to verify that the FDD RSRP absolute and relative accuracy requirements in carrier aggregation are within the specified limits. This test will verify the absolute RSRP accuracy requirements of the primary component carrier defined in clause 9.1.11.1, the absolute RSRP accuracy requirements of the secondary component carriers defined in clause 9.1.11.2, and the relative RSRP accuracy requirements of the secondary component carriers defined in clause 9.1.11.2. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement defined in Clause 9.1.11.3.

A.9.1.40.2 Test parameters

In this set of test cases there are five cells on three carrier frequencies. Cell 1 is PCell on channel 1, and cell 2 and cell 4 are activated SCells on secondary component carriers SCC1 and SCC2 respectively. Cell 3 and cell 5 are neighbouring cells on secondary component carriers SCC1 and SCC2 respectively. The parameters for the test are listed in Table A.9.1.40.2-1.

Table A.9.1.40.2-1: 3 DL TDD RSRP test parameters for E-UTRAN Carrier aggregation (cell #1, cell #2 and cell #3)

Pa	rameter	Unit	Cell 1	Cell 2	Cell 3	
E-UTRA RF Channel			4	,	2	
Number			1	2	2	
			5MHz: $N_{RB,c} = 25$	5MHz: N	I _{RB,c} = 25	
BW _{channel}			$10MHz: N_{RB,c} = 50$	10MHz: N	$N_{RB,c} = 50$	
			$20MHz: N_{RB,c} = 100$	20MHz: N	I _{RB,c} = 100	
Special sub configuration	oframe on ^{Note1}			6		
l Uplink/dowi	nlink			4		
configuration	n ^{Note1}			1		
			5MHz: 10-15	5MHz:	10-15	
Measureme	ent bandwidth	n_{PRB}	10MHz: 22-27	10MHz	:: 22-27	
		11.05	20MHz: 47-52	20MHz	: 47-52	
PDSCH Re	ference		5MHz: R.4 TDD	5MHz: R.4 TDD		
measureme	ent channel		10MHz: R.0 TDD	10MHz: R.0 TDD	-	
defined in A	\.3.1.1.2		20MHz: R.3 TDD	20MHz: R.3 TDD		
			5MHz: 7-17	5MHz: 7-17		
PDSCH allo	ocation	n_{PRB}	10MHz: 13-36	10MHz: 13-36	-	
			20MHz: 38-61	20MHz: 38-61		
	FICH/PHICH		5MHz: R.11 TDD	5MHz: R.11 TDD	5MHz: R.11 TDD	
	measurement		10MHz: R.6 TDD	10MHz: R.6 TDD	10MHz: R.6 TDD	
channel det	fined in A.3.1.2.2		20MHz: R.10 TDD	20MHz: R.10 TDD	20MHz: R.10 TDD	
OCNG Patt	erns defined in		5MHz: OP.9 TDD	5MHz: OP.9 TDD	5MHz: OP.10 TDD	
	erris delined in		10MHz: OP.1 TDD	10MHz: OP.1 TDD	10MHz: OP.2 TDD	
A.3.2.2	A.3.2.2		20MHz: OP.7 TDD	20MHz: OP.7 TDD	20MHz: OP.8 TDD	
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA		1				
PCFICH_R	В	1				
PHICH_RA		1				
PHICH_RB		dB	0	0	0	
PDCCH_R/		ub ub	U	U		
PDCCH_R		-				
PDSCH_RA		+				
PDSCH_R		+				
OCNG_RA	Note2	1				
		-				
OCNG_RB						
Note3	Bands TDD_A	dBm/	-117	, M		
$N_{oc}^{ m \ Note3}$	Bands TDD_C	15kHz	-116	(IV _{oc} for Cha	nannel 1 +1dB)	
	Bands TDD_E	_	-115		T	
\hat{E}_s/N_{oc}		dB	-4	3	-1	
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	-4	0.46	-5.76	
	Bands TDD_A	dBm/	-121	(RSRP for Cell 1	(RSRP for Cell 1	
RSRP ^{Note4}	Bands TDD_C	15kHz	-120	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	
	Bands TDD_E	ISKEZ	-119	+00 <i>b)</i>	T4UD)	
	Bands TDD_A		-87.76 +			
	Danus IDD_A]	10log(N _{RB,c} /50)			
Io ^{Note4}	Bands TDD_C	dBm/	-86.76 +		+5.33dB +10log	
10	שמועס ושט_כ	BW _{channel}	10log(N _{RB,c} /50)	(N _{RB channel2} /	N _{RB channel 1}))	
Pondo TDD F			-85.76 +			
Bands TDD_E		<u> </u>	10log(N _{RB,c} /50)			
Propagation Condition			AWGN	AWGN	AWGN	
Antenna Co			1x2	1x2	1x2	
Timing offse		μS	-	0	3	
Time alignn				-	-	
relative to c	cell 1 Note 7		-	≤TAE	-	
Note 1: For special subfran		no and unlin	k downlink configuratio	no oco Tobles 4 2 1 on	d 4 0 0 in TO 00 044	

For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. OCNG shall be used such that both cells are fully allocated and a constant total transmitted power Note 1:

Note 2: spectral density is achieved for all OFDM symbols.

Interference from other cells and noise sources not specified in the test is assumed to be constant Note 3:

	over subcarriers and time and shall be modelled as AWGN of appropriate power for $^{N_{oc}}$ to be fulfilled.
Note 4:	RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table A.9.1.40.2-2: 3 DL TDD RSRP test parameters for E-UTRAN Carrier aggregation (cell #4 and cell #5)

	rameter	Unit	Cell 4	Cell 5	
E-UTRA RF	Channel			3	
Number			-		
DW		N 41 1-		$_{RB,c} = 25$	
BW _{channel}		MHz	10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$		
Special sub	fromo		ZUIVIHZ: IN	RB,c = 100	
configuration	n Note1		6	6	
Uplink/dow	nlink				
configuration	n ^{Note1}		1		
	··		5MHz:	10-15	
Measureme	ent bandwidth	n_{PRB}	10MHz	: 22-27	
		7105		: 47-52	
PDSCH Re			5MHz: R.4 TDD		
measureme			10MHz: R.0 TDD	N/A	
defined in A	1.3.1.1.2		20MHz: R.3 TDD		
PDSCH allo	antina	10	5MHz: 7-17 10MHz: 13-36	N/A	
PDSCH all	Cation	n_{PRB}	20MHz: 38-61	IN/A	
PDCCH/PC	FICH/PHICH		5MHz: R.11 TDD	5MHz: R.11 TDD	
	measurement		10MHz: R.6 TDD	10MHz: R.6 TDD	
	ined in A.3.1.2.2		20MHz: R.10 TDD	20MHz: R.10 TDD	
	erns defined in		5MHz: OP.9 TDD	5MHz: OP.10 TDD	
A.3.2.2	ems defined in		10MHz: OP.1 TDD	10MHz: OP.2 TDD	
A.S.Z.Z			20MHz: OP.7 TDD	20MHz: OP.8 TDD	
PBCH_RA					
PBCH_RB					
PSS_RA		=			
SSS_RA	<u> </u>	-			
PCFICH_R		-			
PHICH_RA PHICH_RB		40	0	0	
PDCCH_R/		dB	0	0	
PDCCH_R		-			
PDSCH_RA					
PDSCH RE					
OCNG_RA					
OCNG_RB		1			
	Bands TDD_A	alDirec/			
$N_{oc}^{ m Note3}$	Bands TDD_C	dBm/ 15kHz	(N_{ac} for Cha	annel 1 +1dB)	
	Bands TDD_E	TOKEZ		,	
\hat{E}_s/N_{oc}		dB	3	-1	
\hat{E}_s/I_{ot}		dB	0.46	-5.76	
	Bands TDD_A	,		(5.55.5.)	
RSRP ^{Note4}	Bands TDD_C	dBm/	(RSRP for Cell 1	(RSRP for Cell 1	
-	Bands TDD_E	15kHz	+8dB)	+4dB)	
	Bands TDD_A	ا السد ا	/I- t O	. E 00-ID : 401:	
Io ^{Note4}	Bands TDD_C	dBm/	(Io for Channel 1 (N _{RB channel3} /	+5.33dB +10log	
Bands TDD_E		BW _{channel}	(INRB channel3 /	יאא channel 1//	
Propagation Condition			AWGN	AWGN	
Antenna Configuration			1x2	1x2	
Timing offset to Cell 1		μs	0	3	
Time alignn	nent error		≤TAE	-	
relative to c					
Time alignn	nent error		≤TAE		
relative to c	or enecial subfran	no and unlin	k-downlink configuration	ne see Tables 4.2.4	
	or special subfrar and 4.2-2 in TS 36		k-downlink configuratio	ns see Tables 4.2-1	

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Interference from other cells and noise sources not specified in the test is Note 3: assumed to be constant over subcarriers and time and shall be modelled

	as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.40.3 Test Requirements

In the test, the performance of RSRP measurements is verified form following four perspectives:

- The absolute accuracy of intra-frequency RSRP measurements for Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The absolute accuracy of intra-frequency RSRP measurements for Cell 4 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 3 relative to Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of intra-frequency RSRP measurements for Cell 5 relative to Cell 4 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRP measurements between SCC1 and the primary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.
- The relative accuracy of inter-frequency RSRP measurements between SCC2 and the primary component carriers for Cell 4 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.

A.9.1.41 FD-FDD RSRP Intra frequency case for UE category 0

A.9.1.41.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.13.1 and 9.1.13.2 for FD-FDD intra frequency RSRP measurements for UE category 0.

A.9.1.41.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.41.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.1.41.2-1: FD-FDD RSRP Intra frequency test parameters for UE category 0

В	arameter	Unit	Tes	st 1	Tes	st 2	Tes	st 3
		Onit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
	hannel Number				1		1	
BW _{channel}		MHz	1	0	1	0	1	0
Measurement		$n_{{\scriptscriptstyle PRB}}$	22-	–27	22-	–27	22-	–27
	ence measurement		R.13	-	R.13	-	R.13	-
channel define			FDD		FDD		FDD	
PDSCH alloca		$n_{{\it PRB}}$	13—36	-	13—36	-	13—36	-
	CH/PHICH Reference		D.O.		R.6 FDD		R.6 FDD	
A.3.1.2.1	channel defined in		R.6	FDD				
	ns defined in A.3.2.1		OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
	ns defined in A.3.2.1		FDD	FDD	FDD	FDD	FDD	FDD
PBCH_RA								
PBCH_RB								
PSS_RA SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB		dB	0	0	0	0	0	0
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB	1							
OCNG_RA ^{Note}								
OCNG_RB ^{Note}							-1	16
	Bands FDD_A Bands FDD_C						-1	
Note?	Bands FDD_D						-11	
$N_{oc}^{ m Note2}$	Bands FDD_E, FDD_F Note 4	dBm/15 kHz	-10	06	-8	36		
	FDD_F Note 4						-1	
	Bands FDD_G Note 6						-113 -112.5	
2 /	Bands FDD_H						-11	2.5
\hat{E}_s/N_{oc}		dB	6	1	6	1	3	-1
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	2.5	-6	2.5	-6	0.46	-5.76
, s	Bands FDD_A						-113	-117
	Bands FDD_B						-112.5	-116.5
	Bands FDD_C						-112	-116
RSRP ^{Note3}	Bands FDD_D	dBm/15 kHz	-100	-105	-80	-85	-111.5	-115.5
	Bands FDD_E, FDD_F Note 4						-111	-115
	Bands FDD_G Note 6						-110	-114
	Bands FDD_H						-109.5	-113.5
	Bands FDD_A						-82	
	Bands FDD_B							.93
	Bands FDD_C						-81	.43
Io ^{Note3}	Bands FDD_D	dBm/9 MHz	-70	.27	-50	.27	-80	.93
	Bands FDD_E, FDD_F Note 4	G.2, G	. •				-80	.43
Bands FDD_G Note 6							-79	.43
	Bands FDD_G Bands FDD_H							.93
Propagation condition		-	AW	GN	AWGN		AWGN	
Correlation Ma	atrix and Antenna		1)	<u></u>	1)	<u></u>	1x1	
Configuration	NO 1 111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
Note 1: OCI	NG shall be used such t	nat both cells ar	e tully allo	cated and	a constant	total trans	mitted now	/er

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

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

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

Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel

bandwidth within 865-894 MHz.

Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Note 6: Except Band 29 and Band 32.

A.9.1.41.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.13.1 and 9.1.13.2.

A.9.1.42 HD-FDD RSRP Intra frequency case for UE category 0

A.9.1.42.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.13.1 and 9.1.13.2 for HD-FDD intra frequency RSRP measurements for UE category 0.

A.9.1.42.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.42.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.1.42.2-1: HD-FDD RSRP Intra frequency test parameters for UE category 0

-	orom of or	l lmit	Tes	st 1	Tes	st 2	Tes	st 3
P	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF C	hannel Number			1	,		,	1
BW _{channel}		MHz	1	0	1	0	1	0
Measurement	bandwidth	n_{PRB}	22-	-27	22-	-27	22-	-27
PDSCH Refer	ence measurement ed in A.3.1.1.4	T ND	R.1 HD- FDD	-	R.1 HD- FDD	-	R.1 HD- FDD	-
PDSCH alloca	tion	n_{PRB}	13—36	-	13—36	-	13—36	-
	CH/PHICH Reference channel defined in		R.3 HD-FDD		R.3 HI	O-FDD	R.3 HI	O-FDD
OCNG Patterr	ns defined in A.3.2.1		OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB	Bands DD_A	dB	0	0	0	0		0
$N_{oc}^{$	Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H	dBm/15 kHz	-106		-86		-115 -114.5 -114 -113 -112.5	
\hat{E}_s/N_{oc}		dB	6	1	6	1	3	-1
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	2.5	-6	2.5	-6	0.46	-5.76
RSRP ^{Note3}	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 4 Bands FDD_G Note 6 Bands FDD_H	dBm/15 kHz	-100	-105	-80	-85	-113 -112.5 -112 -111.5 -111 -110 -109.5	-117 -116.5 -116 -115.5 -115 -114 -113.5
Io ^{Note3}	Bands FDD_A Bands FDD_B Bands FDD_D Bands FDD_E, FDD_F Note 4 Bands FDD_G Note 5 Bands FDD_H).27		.27	-82.43 -81.93 -81.43 -80.93 -80.43 -79.43 -78.93	
	Propagation condition		AW	'GN	AWGN		AWGN	
Correlation Ma Configuration	atrix and Antenna		1:	k 1	13	< 1	1:	k 1
	NG shall be used such t	hat both calls ar	re fully allo	cated and				

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

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

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

Note 4:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel
	bandwidth within 865-894 MHz.

Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Note 6: Except Band 29 and Band 32.

A.9.1.42.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.13.1 and 9.1.13.2.

A.9.1.43 TDD RSRP Intra frequency case for UE category 0

A.9.1.43.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.13.1 and 9.1.13.2 for TDD intra frequency RSRP measurements for UE category 0.

A.9.1.43.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.43.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.1.43.2-1: TDD RSRP Intra frequency test parameters for UE category 0

Parameter	Por	ramatar	Unit	Tes	st 1	Tes	st 2	Tes	st 3
BWchancol Special subframe configuration Secolar subframe c			Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
Special subframe configuration Signature configuration Notes		nannel Number							-
configuration Notes Uplink/downlink configuration Notes Uplink/downlink configuration Notes 1 1 1 1 1 1 1 1 1			MHz	1	0	1	0	1	0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	configuration No	te1		(6	(6	(6
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Uplink/downlink	configuration Note 1		,	1	•		,	1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			n_{PRB}		–27	22-	–27	22-	–27
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2					-		-		-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2	PDSCH allocat	ion	n_{PRB}	13—36	-	13—36	-	13—36	-
A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD) BECH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RB PDCCH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB CONG_RB ^{Note2} OCNG_RB ^{Note2} OCNG_RB ^{Note2} OCNG_RBNote2 ABands TDD_E Bands TDD_C Bands TDD_E Bands TDD_E Bands TDD_E Bands TDD_E Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_	Reference mea	surement channel		R.6	TDD	R.6	TDD	R.6	TDD
PBCH RB	A.3.2.2.1 (OP.1 A.3.2.2.2 (OP.2	I TDD) and							
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB		dB	0	0	0	0		-
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	N _{oc}	Bands TDD_C	dBm/15 kHz	-1	06	-8	86		
RSRPNote4 Bands TDD_A Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_A Bands TDD_A Bands TDD_C Bands TDD_E Ba		_ Dando IDD_L	dB	6	1	6	1		
RSRPNote4 Bands TDD_A Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_A Bands TDD_A Bands TDD_C Bands TDD_E Ba	$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	2.5	-6	2.5	-6	0.5	-5.76
Bands TDD_C		Bands TDD_C	dBm/15 kHz	-100	-105	-80	-85	-112	-116
Bands TDD_C									2.43
Propagation condition - AWGN AWGN AWGN Correlation Matrix and Antenna Configuration 1x1 1x1 1x1			dBm/9 MHz	-70	.27	-50	.27		
Correlation Matrix and Antenna Configuration 1x1 1x1 1x1		Bands TDD_E						-80	.43
Correlation Matrix and Antenna Configuration 1x1 1x1 1x1	Propagation co			AW	'GN	AW	GN		
	Correlation Ma Configuration	trix and Antenna		1)	k 1	1:	(1	1:	x1

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over

subcarriers and time and shall be modelled as AWGN of appropriate power for $^{N_{oc}}$ to be fulfilled.

Note 4: Es/lot, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: E-UTRA operating band groups are as defined in Section 3.5.

A.9.1.43.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.13.1 and 9.1.13.2.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

A.9.2 RSRQ

A.9.2.1 FDD Intra frequency case

A.9.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.1.5.1.

A.9.2.1.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement is tested by using the parameters in Table A.9.2.1.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.1.2-1: RSRQ FDD Intra frequency test parameters

_			Tes	st 1	Tes	st 2	Tes	st 3
Ра	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF C	hannel Number			1		1		1
BW _{channel}		MHz	1	0	1	0	1	0
Measurement I	bandwidth	$n_{{\scriptscriptstyle PRB}}$	22-	–27	22-	-27	22-	–27
PDSCH Refere channel define	ence measurement d in A.3.1.1.1		R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocat	tion	$n_{\it PRB}$	13—36	-	13—36	-	13—36	-
PDCCH/PCFIC	CH/PHICH asurement channel		R 6	FDD	R 6	FDD	R 6	FDD
defined in A.3.			11.0	100	11.0	100	14.0	100
OCNG Pattern			OP.1	00.0	OD 4	00.0	OP.1	00.0
A.3.2.1.1 (OP.			FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	FDD	OP.2 FDD
A.3.2.1.2 (OP.2	2 FDD)							
PBCH_RA PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB		dB	0	0	0	0	0	0
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB	1							
OCNG_RA ^{Note}								
OCNG_RB ^{Note}								
	Bands FDD_A							16
	Bands FDD_B							5.5
	Bands FDD_C							15
$N_{oc}^{ m Note2}$	Bands FDD_D	dBm/15 kHz	0.4.70	04.70	400.05	-103.85	-11	4.5
oc .	Bands FDD_E, FDD_F Note 5		-84.76	-84.76	-103.85		-1	14
	Bands FDD G						4	40
	Note 7 Bands FDD_H							2.5
Ê/I	Dalius FDD_H	-10	4.70	4.70	4.7	4.7		
\hat{E}_{s}/I_{ot}	T	dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
	Bands FDD_A						-120	-120
	Bands FDD_B						-119.5	-119.5
	Bands FDD_C						-119	-119
RSRP ^{Note3}	Bands FDD_D	dBm/15 kHz	-81.76	-81.76	-106.75	-106.75	-118.5	-118.5
KOKP	Bands FDD_E, FDD_F Note 5	UDIII/13 KI IZ	-81.76	-01.70	-100.73	-100.73	-118	-118
	Bands FDD_G Note 7						-117	-117
	Bands FDD_H					<u> </u>	-116.5	-116.5
	Bands FDD_A							
	Bands FDD_B							
	Bands FDD_C							
Notes	Bands FDD_D							
RSRQ ^{Note3}	Bands FDD_E,	dB	-14.77	-14.77	-16.76	-16.76	-17.34	-17.34
	FDD_F Note 5							
	Bands FDD_G Note 7							
	Bands FDD_H							
	Bands FDD_A						-85	5.67
Io ^{Note3}	Bands FDD_B						-85	5.17
	Bands FDD_C	dBm/9 MHz	-50	-50	-73	-73	-84	.67
10	Bands FDD_D	אוווסו אוויסוא פיוויסט	-50	-50	-73	-13	-84	.17
	Bands FDD_E, FDD_F Note 5						-83	3.67
L	ι υυ_Γ		1		1			

	Bands FDD_G						-82	
	Bands FDD_H						-82	.17
\hat{E}_s/N_{oc}		dB	3	3	-2.9	-2.9	-4	-4
Propagati	ion condition	-	AW	GN	AW	'GN	AW	'GN
Note 1: Note 2:	spectral density is achieved for all OFDM symbols.							
	subcarriers and time and	shall be modelled	as AWGN	of approp	riate powe	r for N_{oc} :	to be fulfille	ed.
Note 3:	RSRQ, RSRP and lo leve are not settable paramete		ved from o	ther param	neters for in	nformation	purposes.	They
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.							
Note 5:	For Band 26, the tests shabandwidth within 865-894	•	vith the car	rier freque	ncy of the	assigned E	E-UTRA ch	annel

A.9.2.1.3 Test Requirements

Note 6:

Note 7:

The RSRQ measurement accuracy shall fulfil the requirements in Clause 9.1.5.1.

E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.2 TDD Intra frequency case

Except Band 29 and Band 32.

A.9.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.1.5.1.

A.9.2.2.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement is tested by using the parameters in Table A.9.2.2.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.2.2-1: RSRQ TDD Intra frequency test parameters

Par	rameter	Unit	Tes			st 2		st 3
		Offic	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
	Channel Number			1		1		1
B\	N _{channel} Note1	MHz		0		0		0
Special subfran	ne configuration ^{Note1} Nk configuration ^{Note1}			<u>3</u> 1		<u>6</u> 1		<u>6</u> 1
				-				-
	nent bandwidth	$n_{\it PRB}$		–27		- 27		–27
	ence measurement ined in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCI	-l allocation	$n_{\it PRB}$	13—36	-	13—36	-	13—36	-
measurement A.:	H/PHICH Reference channel defined in 3.1.2.2			TDD		TDD		TDD
	defined in A.3.2.2.1 A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
	CH_RA		100	100	100	100	100	100
	CH_RB							
	SS_RA							
	SS_RA							
	FICH_RB ICH_RA							
	ICH_RB	dB	0	0	0	0	0	0
	CCH_RA	uБ	0	0	0	U	U	U
PDC	CCH_RB							
	SCH_RA							
PDS	SCH_RB							
OCN	G_RA ^{Note2}							
OCN	G_RB ^{Note2}							
$N_{oc}^{ m Note3}$	Bands TDD_A							16
oc oc	Bands TDD_C	dBm/15 kHz	-84.76	-84.76	-103.85	-103.85	-1	15
	Bands TDD_E						-1	14
Ê	$\Sigma_{\rm s}/{ m I}_{ m ot}$	dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
	Bands TDD_A						-120	-120
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-81.76	-81.76	-106.75	-106.75	-119	-119
	Bands TDD_E						-118	-118
RSRQ ^{Note4}	Bands TDD_A, TDD_C, TDD_E	dB	-14.77	-14.77	-16.76	-16.76	-17.34	-17.34
	Bands TDD_A						-85	.67
lo ^{Note4}	Bands TDD_C	dBm/9 MHz	-50	-50	-73	-73	-84	.67
	Bands TDD_E						-83	3.67
\hat{E}_s/N_{oc}		dB	3	3	-2.9	-2.9	-4	-4
	tion condition	-	AW	'GN	AW	'GN	AW	'GN
	enacial subframe and	unlink-downlink	configuration	ne saa Ta	hlas 1 2-1	and 4 2-2 i		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

A.9.2.2.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Sections 9.1.5.1.

A.9.2.3 FDD—FDD Inter frequency case

A.9.2.3.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.6.1 and 9.1.6.2.

A.9.2.3.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. Both RSRQ inter frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.2.3.2-1. In all tests, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.3.2-1: RSRQ FDD—FDD Inter frequency test parameters

			Tes	et 1	Te	st 2	Tes	13
Pa	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF C	hannel Number		1	2	1	2	1	2
BW _{channel}		MHz	10	10	10	10	10	10
Gap Pattern Id			0		0	-	0	-
Measurement	bandwidth	n_{PRB}	22-	-27	22-	–27	22—	-27
PDSCH Refer	ence measurement	TRD	R.0		R.0		D 0 EDD	
channel define			FDD	-	FDD	-	R.0 FDD	•
PDSCH alloca	tion	n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFI0	CH/PHICH	TRB						
Reference me	asurement channel		R.6	FDD	R.6	FDD	R.6 F	DD
defined in A.3.								
OCNG Pattern			OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
A.3.2.1.1 (OP.			FDD	FDD	FDD	FDD	FDD	FDD
A.3.2.1.2 (OP. PBCH_RA	2 FDD)							
PBCH_RB								
PSS RA								
SSS_RA								
PCFICH_RB		1						
PHICH_RA								
PHICH_RB		dB	0	0	0	0	0	0
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB OCNG_RA ^{Note}	1	-						
OCNG_RB ^{Note}	1							
OCNG_KB	Bands FDD_A						-119.5	-119.5
	Bands FDD_B						-119	-119
	Bands FDD_C						-118.5	-118.5
$N_{oc}^{ m Note2}$	Bands FDD_D						-118	-118
TV oc	Bands FDD_E,	dBm/15 kHz	-80	-80	-104.70	-104.70	-117.5	-117.5
	FDD_F Note 5						117.0	117.0
	Bands FDD_G Note 7						-116.5	-116.5
	Bands FDD_H						-116	-116
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	<u> </u>	dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
L _s /L _{ot}	Davida EDD A	45	1.70	1.70	7.0	4.0		
	Bands FDD_A Bands FDD_B	-					-123.5 -123	-123.5
	Bands FDD_B Bands FDD_C						-123	-123 -122.5
	Bands FDD_D						-122	-122
RSRP ^{Note3}	Bands FDD F	dBm/15 kHz	-81.75	-81.75	-108.70	-108.70		
	FDD_F Note 5						-121.5	-121.5
	Bands FDD_G Note 7						-120.5	-120.5
	Bands FDD_H						-120	-120
	Bands FDD_A Bands FDD_B	1						
	Bands FDD_B							
	Bands FDD_D	1						
RSRQ ^{Note3}	Bands FDD F	dB	-14.76	-14.76	-16.25	-16.25	-16.25	-16.25
	FDD_F Note 5							
	Bands FDD_G							
	Bands FDD_H						00.00	00.00
	Bands FDD_A Bands FDD_B	-					-90.26 -89.76	-90.26 -89.76
. Note?	Bands FDD_B Bands FDD_C						-89.26	-89.76
Io ^{Note3}	Bands FDD_C Bands FDD_D	dBm/9 MHz	-50	-50	-75.46	-75.46	-88.76	-88.76
		1						
	Bands FDD_E, FDD_F Note 5						-88.26	-88.26

	Bands FDD_G Note 7						-87.26	-87.26
	Bands FDD_H						-86.76	-86.76
\hat{E}_s/N_{oc}		dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
Propagation	on condition	-	AW	'GN	AW	'GN	AWO	3N
Note 1: Note 2:	spectral density is achieved for all OFDM symbols.							ant over
Note 3:	RSRQ, RSRP and lo leve are not settable parameter	els have been	derived fro	m other pa	rameters fo	or informati	on purposes	. They
Note 4:	RSRP and RSRQ minimu each receiver antenna po		ts are spec	cified assur	ming indep	endent inte	erference and	I noise at
Note 5:		Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel dwidth within 865-894 MHz.						nannel
Note 6: Note 7:	E-UTRA operating band of Except Band 29 and Band		defined in S	Section 3.5	i.			

A.9.2.3.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Sections 9.1.6.1 and 9.1.6.2.

A.9.2.4 TDD—TDD Inter frequency case

A.9.2.4.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.6.1 and 9.1.6.2.

A.9.2.4.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. Both RSRQ inter frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.2.4.2-1 for TDD configuration 1 and in Table A.9.2.4.2-2 for TDD configuration 0. In all tests, Cell 1 is the PCell and Cell 2 the target cell.

Table A 9.2.4.2-1: RSRQ TDD—TDD Inter frequency test parameters for TDD configuration 1

Por	romotor	Unit	Tes	st 1	Tes	t 2	Tes	st 3
Par	ameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
	Channel Number		1	2	1	2	1	2
	V _{channel}	MHz	10	10	10	10	10	10
	Pattern Id ne configuration Note1		0	-	0	-	0	-
	ne configuration k configuration Note1			<u>6</u> 1	6		6	
•			-		-			-
	ent bandwidth	$n_{\it PRB}$	22-	–27	22—	-27	22-	–27
	ence measurement ined in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH	H allocation	$n_{\it PRB}$	13—36	-	13—36	-	13—36	-
measurement A.:	H/PHICH Reference channel defined in 3.1.2.2			TDD	R.6 T	DD		TDD
	defined in A.3.2.2.1 A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
	CH_RA		100	100	100	100	ו טטו	
PBO	CH_RB							
	SS_RA							
	SS_RA				0 0			
	ICH_RB CH_RA							
	CH RB	dB	0	0		0	0	0
	CH_RA	42				Ŭ		Ü
	CH_RB							
	SCH_RA							
	SCH_RB G_RA ^{Note2}							
OCN	G_RB ^{Note2}							
	Bands TDD_A						-119.50	-119.50
$N_{oc}^{ m Note3}$	Bands TDD_C	dBm/15 kHz	-80	-80	-104.70	- 104.70	-118.50	-118.50
	Bands TDD_E					104.70	-117.50	-117.50
Ê	$I_{\rm ot}$	dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
	Bands TDD_A						-123.50	-123.50
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-81.75	-81.75	-108.70	- 108.70	-122.50	-122.50
	Bands TDD_E					100.70	-121.50	-121.50
RSRQ ^{Note4}	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-16.25	-16.25	-16.25
	Bands TDD_A						-90.26	-90.26
Io ^{Note4}	Bands TDD_C	dBm/9 MHz	-50	-50	-75.46	-75.46	-89.26	-89.26
	Bands TDD_E						-88.26	-88.26
	$/N_{oc}$	dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
	tion condition	-		GN	AWO			'GN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 4: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Table A 9.2.4.2-2: RSRQ TDD—TDD Inter frequency test parameters for TDD configuration 0

Pai	rameter	Unit		st 1	Tes		Tes	st 3	
		Ollik	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
	Channel Number		1	2	1	2	1	2	
	V _{channel}	MHz	10	10	10	10	10	10	
	Pattern Id		0	-	0	-	0	-	
Special subfran	ne configuration Note1 lk configuration Note1			3	6			6	
)	0		·	0	
	nent bandwidth	n_{PRB}	22-	–27	22—	-27	22-	- 27	
	ence measurement ined in A.3.1.1.2		R.5 TDD	-	R.5 TDD	-	R.5 TDD	-	
	H allocation	n_{PRB}	13—36	-	13—36	-	13—36	-	
measurement A.	H/PHICH Reference channel defined in 3.1.2.2			TDD	R.6 T		R.6 TDD		
	defined in A.3.2.2.1 A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	
PB PB PS SS PCF PH PH PDC PDC PDS PDS	CH_RA CH_RB SS_RA SS_RA FICH_RB ICH_RA ICH_RA ICH_RB CCH_RA CCH_RB SCH_RA SCH_RA GCH_RB G_RA SCH_RB G_RA Bands TDD_A Bands TDD_E	dB dBm/15 kHz	-80	-80	-104.70	0	-119.50 -118.50 -117.50	-119.50 -118.50 -117.50	
Ê	$E_{\rm s}/I_{\rm ot}$	dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0	
	Bands TDD_A						-123.50	-123.50	
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-81.75	-81.75	-108.70	- 108.70	-122.50	-122.50	
	Bands TDD_E					100.70	-121.50	-121.50	
RSRQ ^{Note4}	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-16.25	-16.25	-16.25	
	Bands TDD_A						-90.26	-90.26	
Io ^{Note4}	Bands TDD_C	dBm/9 MHz	-50	-50	-75.46	-75.46	-89.26	-89.26	
	Bands TDD_E						-88.26	-88.26	
	N_{oc}	dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0	
	tion condition	-		GN	AWO		AWGN		
Note 1: For s	special subframe and	uplink-downlink o	configuratio	ns see Tal	oles 4.2-1 a	and 4.2-2	in 1S 36.2	11.	

A.9.2.4.3 **Test Requirements**

The RSRQ measurement accuracy shall fulfil the requirements in Sections 9.1.6.1 and 9.1.6.2.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Interference from other cells and noise sources not specified in the test is assumed to be constant over Note 3: subcarriers and time and shall be modelled as AWGN of appropriate power for $\,N_{oc}\,$ to be fulfilled.

RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They Note 4: are not settable parameters themselves.

RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at Note 5: each receiver antenna port.

E-UTRA operating band groups are as defined in Section 3.5. Note 6:

A.9.2.4A FDD—TDD Inter frequency case

A.9.2.4A.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.6.1 and 9.1.6.2 for FDD—TDD inter frequency measurements.

A.9.2.4A.2 Test parameters

In this set of test cases the two cells are on different carrier frequencies. Both absolute and relative accuracy of RSRQ inter frequency measurements are tested by using the parameters in Table A.9.2.4A.2-1 and Table A.9.2.4A.2-2. In all test cases, Cell 1 is the PCell and Cell 2 the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. The inter frequency measurements are supported by a measurement gap.

Table A.9.2.4A.2-1: RSRQ FDD—TDD Inter frequency test parameters (FDD Cell1)

Dovementor	Unit	Test 1 Test 2		Test 3	
Parameter	Unit	Cell 1	Cell 1	Cell 1	
E-UTRA RF Channel Number		1	1	1	
BW _{channel}	MHz	10	10	10	
Gap Pattern Id		0	0	0	
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD	R.0 FDD	R.0 FDD	
PDSCH allocation	n_{PRB}	13—36	13—36	13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD	R.6 FDD	R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA ^{Note1} OCNG_RB ^{Note1}	dB	0	0	0	
$N_{oc}^{ m Note2}$	dBm/15 kHz	-80	-104.70	-114.5	
\hat{E}_{s}/I_{ot}	dB	-1.75	-4.0	-4.0	
RSRP ^{Note3}	dBm/15 kHz	-81.75	-108.70	-118.5	
RSRQ ^{Note3}	dB	-14.76	-16.25	-16.25	
lo ^{Note3}	dBm/9 MHz	-50	-75.46	-85.26	
\hat{E}_s/N_{oc}	dB	-1.75	-4.0	-4.0	
Propagation condition	-	AWGN	AWGN	AWGN	

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

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

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

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table A.9.2.4A.2-2: RSRQ FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2	Test 3
	Oilit	Cell 2	Cell 2	Cell 2
E-UTRA RF Channel Number		2	2	2
BW _{channel}	MHz	10	10	10
Gap Pattern Id		-	-	-
Special subframe configuration		6	6	6
Uplink-downlink configuration Note1		1	1	1
Measurement bandwidth	$n_{\it PRB}$	22—27	22—27	22—27
PDSCH Reference measurement channel		-	-	-
PDSCH allocation	$n_{\it PRB}$	-	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA				
PBCH_RB				
PSS_RA	_			
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB	dB	0	0	0
PDCCH_RA				
PDCCH_RB	=			
PDSCH_RA	=			
PDSCH_RB				
OCNG_RA ^{Note2}	=			
OCNG_RB ^{Note2}				
$N_{oc}^{ m Note3}$	dBm/15 kHz	-80	-104.70	-114.50
\hat{E}_{s}/I_{ot}	dB	-1.75	-4.0	-4.0
RSRP ^{Note4}	dBm/15 kHz	-81.75	-108.70	-118.50
PSPO ^{Note4}	dB	-14.76	-16.25	-16.25
Io ^{Note4}	dBm/9 MHz	-50	-75.46	-85.26
\hat{E}_s/N_{oc}	dB	-1.75	-4.0	-4.0
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.

Note 4: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

A.9.2.4A.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in sections 9.1.6.1 and 9.1.6.2.

A.9.2.5 FDD RSRQ for E-UTRA Carrier Aggregation

A.9.2.5.1 Test Purpose and Environment

The purpose of this test is to verify that the FDD RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency

RSRQ measurements for the primary component carrier specified in clause 9.1.11.1, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier specified in clause 9.1.11.2 and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers specified in clause 9.1.11.3.

A.9.2.5.2 Test parameters

In this test case the PCell and the SCell are on different carrier frequencies. There are three cells used in this test case. Both RSRQ absolute and relative accuracy requirements of the primary and secondary component carrier are tested by using test parameters specified in Table A.9.2.5.2-1. In the test, Cell 1 is the PCell, Cell 2 is the SCell on the Secondary Component Carrier (SCC) and Cell 3 is the neighbouring cell on the SCC. The SCC is configured and activated.

Table A.9.2.5.2-1: FDD RSRQ Carrier Aggregation test parameters

D	Test 1				
Parameters		Units	Cell 1	Cell 2	Cell 3
	E-UTRA RF Channel Number		1	2	2
BW _{channel_CA}		MHz	10	10	10
Timeing offset to Cell 1 Time alignment error between cell 2 and cell 1		μs	-	0 ≤ Time alignment	3
			-	error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1	-
Measurement bandw		n_{PRB}	22—27	22—27	22—27
PDSCH Reference m defined in A.3.1.1.1	neasurement channel		R.0 FDD	R.0 FDD	-
PDSCH allocation	1011 P. (n_{PRB}	13—36	13—36	-
	el defined in A.3.1.2.1		R.6 FDD	R.6FDD	R.6 FDD
FDD) and A.3.2.1.2 (ned in A.3.2.1.1 (OP.1 OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA					
PBCH_RB PSS_RA					0
SSS_RA					
PCFICH_RB					
PHICH_RA		dB	0	0	
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA ^{Note1}					
OCNG_RB ^{Note1}	T				
	Bands FDD_A	dD /4.5	-119.5	-116	-116
	Bands FDD_B		-119	-115.5	-115.5
λ/ Note2	Bands FDD_C Bands FDD_D		-118.5	-115	-115
$N_{oc}^{ m Note2}$	Bands FDD_B,	dBm/15 kHz	-118	-114.5	-114.5 -114
	FDD F Note 6	KΠZ	-117.5	-114	-114
	Bands FDD_G		-116.5	-113	-113
	Bands FDD_H		-116	-112.5	-112.5
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-4.0	-5.46	-5.46
	Bands FDD_A		-123.5	-120	-120
	Bands FDD_B	ID /45	-123	-119.5	-119.5
	Bands FDD_C		-122.5	-119	-119
RSRP ^{Note3}	Bands FDD_D	dBm/15 kHz	-122	-118.5	-118.5 -118
	Bands FDD_E, FDD_F Note 6	KΠZ	-121.5	-118	
	Bands FDD_G		-120.5	-117	-117
RSRQ ^{Note3}	Bands FDD_H		-120	-116.5	-116.5 -17.34
	Bands FDD_A Bands FDD_B	dB	-16.25	-17.34	
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD F.				
	FDD_F Note 6				
	Bands FDD_G		1		
lo ^{Note3}	Bands FDD_H	dBm/0	-00.36	-95 67	-95 67
IU	Bands FDD_A	dBm/9	-90.26	-85.67	-85.67

	Bands FDD_B	MHz	-89.76	-85.17	-85.17
	Bands FDD_C]	-89.26	-84.67	-84.67
	Bands FDD_D]	-88.76	-84.17	-84.17
	Bands FDD_E, FDD_F Note 6		-88.26	-83.67	-83.67
	Bands FDD_G]	-87.26	-82.67	-82.67
	Bands FDD_H		-86.76	-82.17	-82.17
\hat{E}_s/N_{oc}		dB	-4.0	-4.0	-4.0
Propagation	Propagation condition - AWGN				
Note 1:	OCNG shall be used such that both	n cells are full	y allocated a	nd a constant	t total
	transmitted power spectral density				
Note 2:	Interference from other cells and no	oise sources i	not specified	in the test is	assumed to
	be constant over subcarriers and time and shall be modelled as AWGN of				
	N				
	appropriate power for $^{N_{oc}}$ to be fulfilled.				
Note 3:	RSRQ, RSRP and lo levels have been derived from other parameters for information				
	purposes. They are not settable parameters themselves.				
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent				
	interference and noise at each receiver antenna port.				
Note 5:	The selection of the bands for testing depends on the configuration of the carrier				
	aggregation supported by the UEs				
Note 6:	6: For Band 26, the tests shall be performed with the carrier frequency of the assigned				
	E-UTRA channel bandwidth within 865-894 MHz.				-
Note 7:	e 7: This test verifies the RRM requirement which is independent of channel bandwidth				andwidth
	and is performed according to the principle defined in section A.3.6.1.				
Note 8:	e 8: E-UTRA operating band groups are as defined in Section 3.5.				

A.9.2.5.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in clause 9.1.11.1, 9.1.11.2, and 9.1.11.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 1 on the primary component carrier shall fulfil the requirements specified in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 2 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.11.2
- The relative accuracy of inter-frequency RSRQ measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements specified in clause 9.1.11.3.

A.9.2.6 TDD RSRQ for E-UTRA Carrier Aggregation

The test case in this clause are applicable to carrier aggregation capable UEs which have been configured with a downlink Scell.

A.9.2.6.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD RSRQ measurement accuracy in carrier aggregation is within the specified limits in a synchronized network environment with AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier defined in Clause 9.1.11.1, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier defined in Clause 9.1.11.2, and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers defined in Clause 9.1.11.3.

A.9.2.6.2 Test parameters

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is PCell, Cell 2 is SCell, and Cell 3 is the target cell. PCell and SCell are in different RF channels. Cell 3 is in the same RF channel as Cell 2. The parameters for the test are listed in Table A.9.2.6.2-1.

Table A.9.2.6.2-1: TDD RSRQ test parameters

Para	meter	Unit		Test 1		
		- Cilit	Cell 1	Cell 2	Cell 3	
E-UTRA RF Char BW _{channel}	inei Number	MHz	1	2 10	2	
Timing offset to ce	all 1	μS	_	0	3	
Time alignment el and cell 1	rror between cell 2	μο	-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1	-	
Special subframe	configuration Note1			6		
Uplink-downlink c				1		
Measurement bar		$n_{{\scriptscriptstyle PRB}}$		22—27		
PDSCH Reference channel defined in			R.0 TDD	R.0 TDD	-	
PDSCH allocation		n_{PRB}	13—36	13—36	-	
measurement cha A.3.1.2.2			R.6 TDD	R.6 TDD	R.6 TDD	
OCNG Patterns d (OP.1 TDD) and A TDD)	efined in A.3.2.2.1 A.3.2.2.2 (OP.2		OP.1 TDD	OP.1 TDD	OP.2 TDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RA PDCCH_RA PDCCH_RA PDSCH_RA PDSCH_RA PDSCH_RA OCNG_RA OCNG_RB Note2		dB	0	0	0	
$N_{oc\ Note3}$	Bands TDD_A	-ID /4.5 Lill-	-119.5	-11		
	Bands TDD_C	dBm/15 kHz	-118.5	-115		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	Bands TDD_E	dB	-117.5 -4.0	-11 -5.46	-5.46	
	Bands TDD_A		-123.50	-120	-120	
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-122.50	-119	-119	
	Bands TDD_E]	-121.50	-118	-118	
RSRQ ^{Note4}	dB	-16.25	-17.			
	Bands TDD_A		-90.26	-85.	67	
lo ^{Note4}	Bands TDD_C	dBm/9 MHz	-89.26	-84.	67	
	Bands TDD_E		-88.26	-83.	67	
\hat{E}_s/N_{oc}	ition	dB	-4.0	-4.0	-4.0	
Propagation cond	เนอก	-		AWGN		

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled
	as AWGN of appropriate power for N_{oc} to be fulfilled.
	as AWGN of appropriate power for $\frac{\partial c}{\partial t}$ to be fulfilled.
Note 4:	RSRQ, RSRP and lo levels have been derived from other parameters for
	information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming
	independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the
11010 0.	carrier aggregation supported by the UEs.
Note 7:	This test verifies the RRM requirement which is independent of channel
	bandwidth and is performed according to the principle defined in section
	A.3.6.1.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.6.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in section 9.1.11.1, 9.1.11.2, and 9.1.11.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRQ measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.

A.9.2.7 FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS

A.9.2.7.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction is within the specified limits. This test will verify the requirements in Clause 9.1.5.2 for FDD intra frequency measurements under time domain measurement resource restriction.

A.9.2.7.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Table A.9.2.7.2-1 and Table A.9.2.7.2-2 for non-MBSFN ABS with non-colliding CRS. In all test cases, Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

Table A.9.2.7.2-1: General test parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6	Cell PCIs for Cell 1 and Cell 2 are selected
·		!=0	randomly so that the condition is met.
ABS pattern		'10000000100000001000	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54.
		00001000000010000000	Configured in Cell 1.
		00001000000010000000	The first/leftmost bit corresponds to the
			subframe #0 of a radio frame satisfying SFN
			mod x = 0, where x is the size of the bit string
			(40) divided by 10. No MBSFN subframes are
			cofigured in the ABS subframes in Cell 1.
Time-domain measurement			Configured for Cell 2 measurements by
resource restriction pattern for		10000000100000001000	measSubframePattern-Neigh IE in
neighbour cell measurements on		00001000000010000000	measSubframePatternConfig-Neigh, as defined
RF Channel 1			in TS 36.331 [2], clause 6.3.5.
			measSubframeCellList contains Cell 2.
Time-domain measurement		'010000001000000100	Configured for measurements on Cell 1.
resource restriction pattern for		00000100000001000000	
serving cell measurements			

Table A.9.2.7.2-2: Cell-specific test parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time domain measurement resource restriction with non-MBSFN ABS

Banamatan		1124	Test 1		Tes	st 2	Test 3		
	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
E-UTRA RF Ch	nannel Number			•	1		1		
BW _{channel}		MHz		0	10		10		
Measurement b		$n_{\it PRB}$	22—27		22—27		22-	–27	
	ence measurement		R.0	-	R.0	-	R.0	-	
channel define			FDD		FDD		FDD		
PDSCH allocat		$n_{\it PRB}$	13—36	-	13—36	-	13—36	-	
	surement channel		R.6	FDD	R.6	FDD	R.6	FDD	
defined in A.3.1			11.0	. 55	11.0	. 55	11.0		
OCNG Patterns			OP.5	OP.6	OP.5	OP.6	OP.5	OP.6	
A.3.2.1.5 (OP.5			FDD	FDD	FDD	FDD	FDD	FDD	
A.3.2.1.6 (OP.6 PBCH RA	רטט)								
PBCH_RB									
PCFICH_RB									
PHICH_RA									
PHICH_RB PDCCH_RA		dB	Note 6	0	Note 6	0	Note 6	0	
PDCCH_RB		ub	Note 6	U	Note 6	U	เพอเษ ซ	U	
PDSCH_RA									
PDSCH_RB									
OCNG_RA ^{Note1}									
OCNG_RB ^{Note1}		٩D	4	0	4	0	4	0	
PSS_RA SSS_RA		dB dB	-4 -4	0	-4 -4	0	-4 -4	0	
000_NA	Bands FDD_A	QD.		0		U	-1		
	Bands FDD_B						-11		
	Bands FDD_C						-115		
$N_{oc}^{ m Note2}$	Bands FDD_D	dBm/15 kHz	z -84.76		10'	3.85	-11	4.5	
	Bands FDD_E, FDD_F Note 7	UDIII/13 KI12	-04	.70	-10	3.00	-114 -113		
	Bands FDD G								
	Note 9								
$GDG \hat{F} / M$	Bands FDD_H	15	_		_		-11		
CRS \hat{E}_s/N_{oc}		dB	5	-2	5	-2	5	-4	
CRS (\hat{E}_s/I_{ot})	Note 5 meas	dB	2.88	-2.00	2.88	-2.00	3.54	-4.00	
SCH $\hat{E}_{\scriptscriptstyle s}/I_{\scriptscriptstyle ot}$		dB	-1.12	-5.54	-1.12	-5.54	-0.46	-7.54	
	Bands FDD_A						-111	-120	
	Bands FDD_B						-110.5	-119.5	
	Bands FDD_C Bands FDD_D						-110 -109.5	-119 -118.5	
RSRP ^{Note3,4,5}		dBm/15 kHz	-79.76	-86.76	-98.85	-105.85			
	Bands FDD_E, FDD_F Note 7			_			-109	-118	
	Bands FDD_G Note 9						-108	-117	
	Bands FDD_H						-107.5	-116.5	
	Bands FDD_A,								
(RSRO)									
(RSRO)	FDD_B, FDD_C,		40.00	4 =	40				
$\left(\mathrm{RSRQ} \right)_{meas}$ Note3,4,5	FDD E. FDD F	dB	-12.60	-15.30	-12.60	-15.30	-12.38	-16.69	
(RSRQ) _{meas} Note3,4,5	FDD_E, FDD_F Note 7, FDD G Note	dB	-12.60	-15.30	-12.60	-15.30	-12.38	-16.69	
(RSRQ) _{meas} Note3,4,5	FDD E. FDD F	dB	-12.60	-15.30	-12.60	-15.30	-12.38	-16.69	
(RSRQ) _{meas} Note3,4,5	FDD_E, FDD_F Note ⁷ , FDD_G Note ⁹ , FDD_H	dB	-12.60	-15.30	-12.60	-15.30			
$(RSRQ)_{meas}$ Note3,4,5 $(Io)_{meas}$ Note3	FDD_E, FDD_F Note 7, FDD G Note	dB dBm/9 MHz	-12.60 -50.17	-15.30 -53.64	-12.60 -69.26	-15.30 -72.73	-81.63 -81.13	-85.37 -84.87	

Bands FDD_D				-80.13	-83.87
Bands FDD_E, FDD_F Note 7				-79.63	-83.37
Bands FDD_G Note 9				-78.63	-82.37
Bands FDD_H				-78.13	-81.87
Propagation condition	-	AWGN	AWGN	AW	'GN

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
- Note 3: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
- Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: Applies to restricted measurement subframes of the respective cell.
- Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
- Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 8: E-UTRA operating band groups are as defined in Section 3.5.
- Note 9: Except Band 29 and Band 32.

A.9.2.7.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Clause 9.1.5.2.

A.9.2.8 TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS

A.9.2.8.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction is within the specified limits. This test will verify the requirements in Clause 9.1.5.2 for TDD intra frequency measurements under time domain measurement resource restriction.

A.9.2.8.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Table A.9.2.8.2-1 and Table A.9.2.8.2-2 for non-MBSFN ABS with non-colliding CRS. In all test cases, Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

Table A.9.2.8.2-1: General test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Also the aggressor cell.
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe
			configurations see Table 4.2-1 in [16].
Uplink/downlink subframe		1	For Cell 1 and Cell 2. For uplink-downlink
configuration			subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6	Cell PCIs for Cell 1 and Cell 2 are randomly
		!=0	selected so that the condition is met
ABS pattern			Non-MBSFN ABS. TDD ABS Pattern Info IE, as
		'000000001000000001'	defined in TS 36.423 [28], clause 9.2.54.
			Configured in Cell 1.
			The first/leftmost bit corresponds to the
			subframe #0 of a radio frame satisfying SFN
			mod x = 0, where x is the size of the bit string
			(20) divided by 10. No MBSFN subframes are
			cofigured in the ABS subframes in Cell 1.
Time-domain measurement			Configured for Cell 2 measurements by
resource restriction pattern for		'000000001000000001'	measSubframePattern-Neigh IE in
neighbour cell measurements on			measSubframePatternConfig-Neigh, as defined
RF Channel 1			in TS 36.331 [2], clause 6.3.5.
			measSubframeCellList contains Cell 2.
Time-domain measurement		'100000000100000000'	Configured for Cell 1 measurements.
resource restriction pattern for			
serving cell measurements			

Table A.9.2.8.2-2: Cell-specific test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time domain measurement resource restriction with non-MBSFN ABS

Por	ameter	Unit	Tes	st 1	Test 2		Test 3	
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	annel Number			1		1	,	
BW _{channel}		MHz	1	0	1	0	10	
Measurement b		n_{PRB}		–27	22—27		22—27	
PDSCH Refere channel defined	nce measurement		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocati		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFIC		PRB	10 00		10 00		10 00	
	surement channel		R.6	TDD	R.6	TDD	R.6	TDD
OCNG Patterns A.3.2.2.1 (OP.1 A.3.2.2.2 (OP.2	TDD) and		OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB								
PHICH_RA PHICH_RB				_		_		
PDCCH_RA PDCCH_RB		dB	Note 6	0	Note 6	0	Note 6	0
PDSCH_RA PDSCH_RB OCNG_RA ^{Note1}								
OCNG_RB ^{Note1}								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
$N_{oc}^{ m Note2}$	Bands TDD_A						-116	
oc .	Bands TDD_C Bands TDD_E	dBm/15 kHz	-84.76		-103.85		-115 -114	
CRS \hat{E}_s/N_{oc}		dB	5	-2	5	-2	5	-4
CRS (\hat{E}_{s}/I_{ot})	Note 5 meas	dB	2.88	-2.00	2.88	-2.00	3.54	-4.00
SCH \hat{E}_{s}/I_{ot}		dB	-1.12	-5.54	-1.12	-5.54	-0.46	-7.54
Noto2 4 F	Bands TDD_A						-111	-120
RSRP ^{Note3,4,5}	Bands TDD_C	dBm/15 kHz	-79.76	-86.76	-98.85	-105.85	-110	-119
	Bands TDD_E						-109	-118
(RSRQ) _{meas}	Bands TDD_A, TDD_C, TDD_E	dB	-12.60	-15.30	-12.60	-15.30	-12.38	-16.70
(Io) _{meas} Note3	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/9 MHz	-50.17	-53.64	-69.26	-72.73	-81.63 -80.63 -79.63	-85.37 -84.37 -83.37
Propagation co		_	Δ\Λ	I 'GN	Δ\Λ	GN	-79.63 AW	
	IG shall be used such	that both cells a						

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
- Note 3: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
- Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: Applies to restricted measurement subframes of the respective cell.
- Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
- Note 7: E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.8.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Clause 9.1.5.2.

A.9.2.9 FDD RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS

A.9.2.9.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction is within the specified limits under AWGN propagation conditions. This test will verify the absolute FDD RSRQ accuracy under time domain measurement resource restriction specified in Clause 9.1.5.2.

A.9.2.9.2 Test parameters

The test parameters are given in Tables A.9.2.9.2-1 and A.9.2.9.2-2 below. In this test case there are two cells on the same frequency used in this test case. In the test, Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured by higher layers with a time domain measurement restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

Table A.9.2.9.2-1: General test parameters for FDD RSRQ under time domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
Serving cell (PCell)		Cell 1	Also the aggressor cell on E-UTRA RF channel number 1
Neighbour cell		Cell 2	Cell to be identified on E-UTRA RF channel number 1
PCell ABS configuration		MBSFN ABS	As defined in Table A.3.4.2.1-1
CP length		Normal	
DRX		OFF	
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2}) mod 6 = 0, PCI _{cell1} not equal to PCI _{cell2}	Cell PCIs are selected so that the condition is met (colliding CRS)
Cell 1 MBSFN ABS pattern		'0100000010000001000 00000010000001000000	ABS subframe is only MBSFN subframe. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. Configured in Cell 1.
Time domain measurement resource restriction pattern for PCell (Cell 1) measurements on RF Channel 1		'0001000000100000001 00000001000000010000'	Time domain measurement resource restriction pattern for PCell measurement signalled to the UE in measSubframePatternPCell. The IE MeasSubframePattern is used to specify the time domain measurement resource restriction as defined in TS 36.331 [2], clause 6.3.6. Configured for Cell 1 measurements.
Time domain measurement resource restriction pattern for neighbour cell (Cell 2) measurements on RF Channel 1		'010000010000001000 00000010000001000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh The IE MeasSubframePattern is used to specify the time domain measurement resource restriction as defined in TS 36.331 [2], clause 6.3.6. Configured for Cell 2 measurements.

Table A.9.2.9.2-2: Cell specific test parameters for FDD RSRQ under time domain measurement resource restriction with MBSFN ABS

			Test 1		Test 2		Test 3	
Par	ameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	annel Number		,			ĺ		1
BW _{channel}		MHz	1	0	1	0	1	0
OCNG Patterns			OP.8	OP.6	OP.8	OP.6	OP.8	OP.6
A.3.2.1.8 (OP.8 A.3.2.1.6 (OP.6	FDD) and FDD) Note5		FDD	FDD	FDD	FDD	FDD	FDD
Measurement b		n_{PRB}	22-	 –27	22-	 –27	22-	_27
PDSCH allocati		n_{PRB}	13—36	-	13—36	-	13—36	_
PBCH_RA		PRB						
PBCH_RB		-						
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PDCCH_RB		-						
PDSCH_RA PDSCH_RB		-						
OCNG_RA ^{Note1}		1						
OCNG_RB ^{Note1}		1						
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
	Bands FDD_A			· <u> </u>				16
	Bands FDD_B						-115.5	
	Bands FDD_C						-115 -114.5	
$N_{oc}^{ m Note2}$	Bands FDD_D Bands FDD_E,	dBm/15 kHz	-84	76	-103.85			
	FDD_F Note 8	UDIII/13 KI12	-04	.70			-1	14
	Bands FDD_G Note 10						-1	13
	Bands FDD_H						-11	2.5
CRS \hat{E}_s/N_{oc}		dB	5	-2	5	-2	5	-4
1st OFDM symbo	Note 5, 7 in the	dB	2.88	-8.19	2.88	-8.19	3.54	-10.19
$CRS(\hat{F}/I_{Ot})$	note 5 in OFDM							
symbols 4,7,11	neas OI DIVI	dB	2.88	-2	2.88	-2	3.54	-4
SCH \hat{E}_s/I_{ot}		dB	-1.12	-5.54	-1.12	-5.54	-0.46	-7.54
	Bands FDD_A						-111	-120
	Bands FDD_B	j					-110.5	-119.5
	Bands FDD_C	_					-110	-119
RSRP Note 3,4,5	Bands FDD_D	4D=-/45 !!!	70.70	00.70	00.05	405.05	-109.5	-118.5
RSRP	Bands FDD_E, FDD_F Note 8	dBm/15 kHz	-79.76	-86.76	-98.85	-105.85	-109	-118
	Bands FDD_G Note 10						-108	-117
	Bands FDD_H	<u> </u>					-107.5	-116.5
	Bands FDD_A							
	Bands FDD_B							
	Bands FDD_C	-						
(RSRQ) meas Note 3,4,5	Bands FDD_D Bands FDD_E,	dB	-12.60	-15.02	-12.60	-15.02	-12.38	-16.36
Note 3,4,5 Bands FL FDD F No	FDD_F Note 8	GD	12.00	10.02	12.00	10.02	12.00	10.30
	Bands FDD_G							
	Bands FDD_H	}						
(Io) meas Note 3	Bands FDD_A						-81.63	-85.37
1st OFDM	Bands FDD_B	dBm/9 MHz	-50.17	-53.64	-69.26	-72.73	-81.13	-84.87
symbol	Bands FDD_C						-80.63	-84.37

	Bands FDD_D						-80.13	-83.87
	Bands FDD_E, FDD_F Note 8						-79.63	-83.37
	Bands FDD_G Note 10						-78.63	-82.37
	Bands FDD_H						-78.13	-81.87
	Bands FDD_A						-81.63	-86.76
	Bands FDD_B						-81.13	-86.26
(Io) meas Note 3	Bands FDD_C						-80.63	-85.76
OFDM	Bands FDD_D						-80.13	-85.26
symbols other than the 1 st	Bands FDD_E, FDD_F Note 8	dBm/9 MHz	-50.17	-54.85	-69.26	-73.94	-79.63	-84.76
one	Bands FDD_G Note 10						-78.63	-83.76
	Bands FDD_H						-78.13	-83.26
Propagation cor	ndition	-	AW	'GN	AW	GN	AW	GN

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
- Note 3: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes
- Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: Applies to restricted measurement subframes of the respective cell.
- Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.2.1-1.
- Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/lot side condition in 9.1.5.2.
- Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 9: E-UTRA operating band groups are as defined in Section 3.5.
- Note 10: Except Band 29 and Band 32.

A.9.2.9.3 Test Requirements

In the test, the RSRQ measurement accuracy under time domain measurement resource restriction shall fulfil the requirements in Clause 9.1.5.2

A.9.2.10 TDD Intra frequency case under time domain measurement resource restriction with MBSFN ABS

A.9.2.10.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction is within the specified limits. This test will verify the requirements in Clause 9.1.5.2 for TDD intra frequency measurements under time domain measurement resource restriction.

A.9.2.10.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Table A.9.2.10.2-1 and Table A.9.2.10.2-2 for MBSFN ABS with colliding CRS. In all test cases, Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

Table A.9.2.10.2-1: General test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		MBSFN ABS	As defined in Table A.3.4.2.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe
			configurations see Table 4.2-1 in [16].
Uplink/downlink subframe		1	For Cell 1 and Cell 2. For uplink-downlink
configuration			subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6	Cell PCIs for Cell 1 and Cell 2 are selected
		=0 PCI _{cell1} not equal to	randomly so that the condition is met
		PCI _{cell2}	
ABS pattern			MBSFN ABS pattern. TDD ABS Pattern Info IE,
		'00001000000000100000'	as defined in TS 36.423 [28], clause 9.2.54.
			Configured in Cell 1.
			The first/leftmost bit corresponds to the
			subframe #0 of a radio frame satisfying SFN
			mod x = 0, where x is the size of the bit string
			(20) divided by 10. All ABS subframes are
- :			MBSFN subframes.
Time-domain measurement		(0000400000000400004	Configured for Cell 2 measurements by
resource restriction pattern for		'0000100000000100000'	measSubframePattern-Neigh IE in
neighbour cell measurements on			measSubframePatternConfig-Neigh, as defined
RF Channel 1			in TS 36.331 [2], clause 6.3.5.
			measSubframeCellList contains Cell 2.
Time-domain measurement		'100000000100000000'	Configured for measurements on Cell 1.
resource restriction pattern for			
serving cell measurements			

Table A.9.2.10.2-2: Cell-specific test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time domain measurement resource restriction with MBSFN ABS

Down		l lmit	Tes	st 1	Test 2		Test 3	
	ameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Cha	annel Number	N 41 1				1		1
BW _{channel}		MHz		0	10		10	
Measurement ba		$n_{\it PRB}$	22—27		22-	–27	22-	–27
	ice measurement		R.0	-	R.0	-	R.0	-
channel defined			TDD		TDD		TDD	
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
defined in A.3.1.	surement channel 2.2		R.6	TDD	R.6	TDD	R.6	TDD
OCNG Patterns A.3.2.2.5 (OP.5 A.3.2.2.2 (OP.2	TDD) and		OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA								
PBCH_RB								
PCFICH_RB PHICH_RA								
PHICH_RB								
PDCCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PDCCH_RB								
PDSCH_RA PDSCH_RB								
OCNG_RA ^{Note1}								
OCNG_RB ^{Note1}								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA	1	dB	-4	0	-4	0	-4	0
$N_{oc}^{ m Note2}$	Bands TDD_A		-84.76		-103.85		-116	
1 voc	Bands TDD_C	dBm/15 kHz					-115	
	Bands TDD_E					1	-1	14
CRS \hat{E}_s/N_{oc}		dB	5	-2	5	-2	5	-4
CRS								
	Note 5, 7	dB	2.88	-8.19	2.88	-8.19	3.54	-10.19
In the 1 st OFDM	Note 5 : OFDIA							
symbols 4,7,11	Note 5 in OFDM	dB	2.88	-2	2.88	-2	3.54	-4
SCH \hat{E}_{s}/I_{ot}		dB	-1.12	-5.54	-1.12	-5.54	-0.46	-7.54
Note 2.4.5	Bands TDD_A						-111	-120
RSRP Note 3,4,5	Bands TDD_C	dBm/15 kHz	-79.76	-86.76	-98.85	-105.85	-110	-119
	Bands TDD_E						-109	-118
(RSRQ) _{meas} Note 3,4,5	Bands TDD_A, TDD_C, TDD_E	dB	-12.60	-15.02	-12.60	-15.02	-12.38	-16.36
$(Io)_{meas}^{Note 3}$	Bands TDD_A						-81.63	-85.37
in the 1 st	Bands TDD_C	dBm/9 MHz	-50.17	-53.64	-69.26	-72.73	-80.63	-84.37
OFDM symbol	Bands TDD_E						-79.63	-83.37
$(Io)_{meas}$ Note 3	Bands TDD_A						-81.63	-86.76
in OFDM	Bands TDD_C						-80.63	-85.76
symbols other than the 1 st one	Bands TDD_E	dBm/9 MHz	-50.17	-54.85	-69.26	-73.94	-79.63	-84.76
Propagation con	dition	-	AW	GN	AW	I 'GN	ΑW	'GN
. ropagation con			, , , , , ,	J. 1	, , , , , ,	<u></u>	, , , , , ,	J. 1

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over
	subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
	Applies to all subframes.
Note 3:	RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table A.3.4.2.1-1.
Note 7:	In the 1 st OFDM symbol, Cell 2 is not expected to meet the Es/lot side condition in 9.1.5.2.
Note 8:	F-UTRA operating band groups are as defined in Section 3.5.

A.9.2.10.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in clause 9.1.5.2.

A.9.2.11 FDD RSRQ for E-UTRA Carrier Aggregation (20MHz bandwidth)

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink SCell.

A.9.2.11.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.9.2.5.1.

A.9.2.11.2 Test parameters

The parameters of this test are the same as defined in Subclause A.9.2.5.2 except that the values of the parameters in the Table A.9.2.11.2-1 will replace the values of the corresponding parameters in A.9.2.5.2-1.

Table A.9.2.11.2-1: FDD RSRQ Carrier Aggregation test parameters

	oromotoro	Test 1							
Г	arameters	Units	Cell 1	Cell 2	Cell 3				
BW _{channel}	Note 1 _CA	MHz	20	20	20				
Measure	ment bandwidth	n_{PRB}	47-52	47-52	47-52				
measure	Reference ment channel n A.3.1.1.1		R.4 FDD	R.4 FDD	-				
PDSCH a	allocation	n_{PRB}	38-61	38-61	-				
Referenc	PCFICH/PHICH e measurement defined in		R.10 FDD	R.10 FDD	R.10 FDD				
OCNG Patterns defined in A.3.2.1.11 (OP.11 FDD) and A.3.2.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD				
	Bands FDD_A		-87.26	-82.67					
	Bands FDD_B Note 5		-86.76	-82.17					
Note 2	Bands FDD_C Note 5	dBm/18	-86.26	-81.67					
lo ^{Note2}	Bands FDD_D Note 5	MHz	-85.76	-81.17					
	Bands FDD_E Note 5		-85.26	-80.67					
	Bands FDD_G Note 5		-84.26	-79.67					
	Bands FDD_H Note 5		-83.76	-79.17					
Note 1:	This test verifies the of channel bandwin	idth and is p	erformed a						
Note 2:	principle defined in lo levels have been information purpose themselves	en derived fr	om other pa						
Note 3:	See Table A.9.2.5								
Note 4:	E-UTRA operating band groups are as defined in Section 3.5.								
Note 5:	The test applies for group which are s								

A.9.2.11.3 Test Requirements

The test requirements defined in section A.9.2.5.3 shall apply in this test case.

A.9.2.12 TDD RSRQ for E-UTRA Carrier Aggregation (20MHz bandwidth)

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink SCell.

A.9.2.12.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.9.2.6.1.

A.9.2.12.2 Test parameters

The parameters of this test are the same as defined in Subclause A.9.2.6.2 except that the values of the parameters in the Table A.9.2.12.2-1 will replace the values of the corresponding parameters in A.9.2.6.2-1.

Table A.9.2.12.2-1: TDD RSRQ Carrier Aggregation test parameters

D-	romotoro		Tes	st 1				
Pa	rameters	Units	Cell 1	Cell 2	Cell 3			
BW _{channel_0}	Note1 CA	MHz	20	20	20			
Measurem	nent bandwidth	n_{PRB}	47-52	47-52	47-52			
PDSCH R measurem defined in	nent channel		R.3 TDD	R.3 TDD	-			
PDSCH al	llocation	n_{PRB}	38-61	38-61	-			
	CFICH/PHICH measurement efined in		R.10 TDD	R.10 TDD	R.10 TDD			
A.3.2.2.7	tterns defined in (OP.7 TDD) and (OP.8 TDD)		OP.7 TDD	OP.7 TDD	OP.8 TDD			
	Bands TDD_A Note 5	dBm/18	-87.26	-82.67				
lo ^{Note2}	Bands TDD_C Note 5	MHz	-86.26	-81.67				
	Bands TDD_E Note 5		-85.26	-80.67				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters								
Note 3: Note 4: Note 5:	themselves See Table A.9.2.6 E-UTRA operating The test applies for group which are s	.2-1 for the g band group or E-UTRA c	other paran ps are as de operating ba	neters. efined in Seands in this l	ction 3.5. band			

A.9.2.12.3 Test Requirements

The test requirements defined in section A.9.2.6.3 shall apply in this test case.

A.9.2.13 Void

A.9.2.13.1 Void

A.9.2.13.2 Void

Table A.9.2.13.2-1: Void

A.9.2.13.3 Void

A.9.2.14 Void

A.9.2.14.1 Void

A.9.2.14.2 Void

Table A.9.2.14.2-1: Void

A.9.2.14.3 Void

A.9.2.15 FDD RSRQ under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.9.2.15.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with CRS assistance information is within the specified limits. This test will verify the requirements in Clause 9.1.5.3 for FDD intra frequency measurements under time domain measurement resource restriction with CRS assistance information.

A.9.2.15.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table A.9.2.15.2-1 and Table A.9.2.15.2-2 for non-MBSFN ABS with colliding CRS between Cell1 and Cell3 and non-colliding CRS between Cell1 and Cell2. In all test cases, Cell 1 is the serving/aggressor cell, Cell2 is the neighbour/aggressor cell and Cell3 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

Note: It's up to eNB's implementation whether the time domain measurement resource restriction pattern for PCell measurements is configured or not.

Table A.9.2.15.2-1: General test parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parar	meter	Unit	Value	Comment		
PCell			Cell 1	Serving/aggressor cell		
Neighbour cells			Cell 2	Neighbour/aggressor cell		
			Cell3	Cell to be measured		
ABS transmissio	n configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1		
CP length	<u>-</u>		Normal	For all cells in the test		
DRX				OFF		
Time offset betw	een cells	μs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to	Three synchronous cells		
			Cell 1: -2.5			
Physical cell IDs			(PCI _{cell1} - PCI _{cell3})mod6 = 0 (PCI _{cell2} - PCI _{cell3})mod6 != 0 PCI _{cell1} not equal to PCI _{cell3}	Cell PCIs are selected so that all conditions are met		
ABS pattern			'100000001000000100000 001000000010000000	FDD ABS Pattern Info IE, as defined in TS 36.423[28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in Cell 1 and Cell 2.		
Time domain me resource restricti neighbour cell m RF Channel 1			'100000001000000100000 001000000010000000	Time domain measurement resource restriction pattern for neighbor cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.		
resource restricti	Time-domain measurement resource restriction pattern for serving cell measurements		'0100000001000000010000 000100000001000000	Configured for measurements on Cell 1.		
	physCellId		see PCI conditions above	Only the CRS information of cell 2 is		
CRS assistance	antennaPortsC ount		1	provided in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element		
information			oneFrame = '000000'	with subframe allocation one Frame='000000'.		

Table A.9.2.15.2-2: Cell-specific test parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

				Test 1			Test 2			Test 3	
Par	ameter	Unit	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Ch	annel Number		•	1		•	1		•	1	-
BW _{channel}		MHz		10			10			10	
Measurement b		n_{PRB}		22—27	•		22—27	•		22—27	•
PDSCH Refere channel defined	nce measurement d in A.3.1.1.1		R.0 FDD		-	R.0 FDD		-	R.0 FDD		-
PDSCH allocati		n_{PRB}	13— 36		-	13— 36		-	13— 36		-
PDCCH/PCFIC Reference mea defined in A.3.1	surement channel		ı	R.6 FDI)	I	R.6 FDI)	ı	R.6 FDI)
OCNG Patterns A.3.2.1.5 (OP.5 A.3.2.1.6 (OP.6	s defined in 5 FDD) and		OP. 5 FDD	OP. 6 FDD	OP.6 FDD	OP. 5 FDD	OP. 6 FDD	OP.6 FDD	OP. 5 FDD	OP. 6FD D	OP.6 FDD
PBCH_RA	,							I			I
PBCH_RB											
PSS_RA SSS_RA											
PCFICH_RB											
PHICH_RA			Note			Note			Note		
PHICH_RB		dB	6	0		6	0		Note 6		0
PDCCH_RA PDCCH_RB											
PDSCH_RA											
PDSCH RB	PDSCH RB										
OCNG_RA Note	1										
OCNG_RB Note	Bands FDD_A									-116	
	Bands FDD_B									-115.5	
	Bands FDD_C	dBm/	-84.76			-103.85			-115		
$N_{oc}^{ m Note~2}$	Bands FDD_D								-114.5		
oc	Bands FDD_E, FDD_F Note 7	15 kHz							-114		
	Bands FDD_G Note 9								-113		
	Bands FDD_H				1					-112.5	
CRS \hat{E}_s/N_{oc}		dB	4	2	-1.5	4	2	-1.5	4	2	-4
CRS (\hat{E}_s/I_{ot})	Note 5 meas	dB	- 1.18	0.32	-6.96	- 1.18	- 0.32	-6.96	- 0.75	0.54	-9.46
	Bands FDD_A								-112	-114	-120
	Bands FDD_B								111. 5	113. 5	119. 5
	Bands FDD_C								-111	-113	-119
RSRP Note 3,4,5	Bands FDD_D	dBm/	-	-	-	-	-	-	110. 5	112. 5	118. 5
KOKP	Bands FDD_E, FDD_F Note 7	15 kHz	80.7 6	82.7 6	86.2 6	99.8 5	101. 85	105. 35	-110	-112	-118
	Bands FDD_G Note 9								-109	-111	-117
	Bands FDD_H								108. 5	110. 5	116. 5
(RSRQ) _{meas} Note 3,4,5	Bands FDD_A, FDD_B, FDD_C, FDD_D, FDD_E, FDD_F Note 7, FDD_G Note 9, FDD_H	dB	- 14.4 3	- 11.5 9	- 15.0 9	- 14.4 3	- 11.5 9	- 15.0 9	- 14.1 9	- 10.8 1	- 16.8 1
			1	•					•		•

	Bands FDD_A						- 80.8 2	-85.03
$(Io)_{meas}$ Note 3	Bands FDD_B	dBm/ 9 MHz	49.3		- 68.4 3	-72.28	- 80.3 2	-84.54
	Bands FDD_C						- 79.8 2	-84.04
	Bands FDD_D						- 79.3 2	-83.54
	Bands FDD_E, FDD_F Note 7						- 78.8 2	-83.04
	Bands FDD_G Note 9						- 77.8 2	-82.04
	Bands FDD_H						- 77.3 2	-81.54
Propagation co		-	AWGN			AWGN	AWGN	

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
- Note 3: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
- Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
- Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
- Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 8: E-UTRA operating band groups are as defined in Section 3.5.
- Note 9: Except Band 29 and Band 32.

A.9.2.15.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Clause 9.1.5.3.

A.9.2.16 TDD RSRQ under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.9.2.16.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with CRS assistance information is within the specified limits. This test will verify the requirements in Clause 9.1.5.3 for TDD intra frequency measurements under time domain measurement resource restriction with CRS assistance information.

A.9.2.16.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table A.9.2.16.2-1 and Table A.9.2.16.2-2 for non-MBSFN ABS with colliding CRS between Cell1 and Cell3 and non-colliding CRS between Cell1 and Cell2. In all test cases, Cell 1 is the serving/aggressor cell, Cell2 is the neighbour/aggressor cell and Cell3 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell1 with a time domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

Note: It's up to eNB's implementation whether the time domain measurement resource restriction pattern for PCell measurements is configured or not.

Table A.9.2.16.2-1: General test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter	Unit	Value	Comment
PCell		Cell 1	Serving/aggressor cell
Neighbour cells		Cell 2	Neighbour/aggressor cell
		Cell3	Cell to be measured
Special subframe configuration	on	6	For Cell 1, Cell 2 and Cell 3. For special
			subframe configurations see Table 4.2-1 in
			[16].
Uplink/downlink subframe		1	For Cell 1, Cell 2 and Cell 2. For uplink-
configuration			downlink subframe configurations see Table
			4.2-2 in [16].
ABS transmission configuration	on	Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
CP length		Normal	For all cells in the test
DRX			OFF
Time offset between cells	μs	Cell 2 offset with respect to	Three synchronous cells
		Cell 1: 0	
		Cell 3 offset with respect to	
		Cell 1: -2.5	Oall Bolance calcuted as that all associations
Dhysical cell IDs		$(PCI_{cell1} - PCI_{cell3}) mod6 = 0$ $(PCI_{cell2} - PCI_{cell3}) mod6 != 0$	Cell PCIs are selected so that all conditions
Physical cell IDs		PCI _{cell1} not equal to PCI _{cell3}	are met
		FCI _{cell1} not equal to FCI _{cell3}	TDD ABS Pattern Info IE, as defined in TS
			36.423 [28], clause 9.2.54.
			The first/leftmost bit corresponds to the Pcell
			subframe #0 of the radio frame satisfying
ABS pattern		'000000001000000001'	SFN mod $x = 0$, where x is the size of the bit
/ Lo pallolli			string (20) divided by 10. No MBSFN
			subframes are configured in the ABS
			subframes.
			Provided fto the UE for Cell 1 and Cell 2.
			Time domain measurement resource
			restriction pattern for neighbor cell
Time domain measurement			measurement signalled to the UE in
resource restriction pattern fo	ır İ		measSubframePatternNeigh IE in
neighbour cell measurements		'000000001000000001'	measSubframePatternConfigNeigh, as
RF Channel 1	, 011		defined in TS 36.331, clause 6.3.5.
Tra Gridinier i			Provided to the UE for Cell 3 measurements.
			The cell list in measSubframeCellList IE shall
			contain Cell 3 but not Cell 2.
<u> </u>			Configured for Cell 1 measurements.
Time-domain measurement		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
resource restriction pattern for	r	'100000000100000000'	
serving cell measurements			
physCellId		see PCI conditions above	
 	rtsC		Only the CRS assistance information of cell 2
assistance ount		1	is provided for Cell 2 only in CRS- AssistanceInfo. It includes a single MBSFN-
information mbsfn- SubframeC	onfi	oneFrame = '000000'	SubframeConfig element with subframe
gList	OHIII	onerrame = 00000	allocation one Frame='000000'.
y List	L	l .	

Table A.9.2.16.2-2: Cell-specific test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

				Test 1			Test 2		Test 3		
Pai	rameter	Unit	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Ch	nannel Number		1	1	3	•	1	<u> </u>	ı	1	<u> </u>
BW _{channel}		MHz		10			10			10	
Measurement b	oandwidth	n_{PRB}		22—27	•		22—27	•		22—27	
PDSCH Refere	nce measurement d in A.3.1.1.2		R.0 TDD		-	R.0 TDD		-	R.0 TDD		-
PDSCH allocat	ion	n_{PRB}	13— 36		-	13— 36		-	13— 36		-
PDCCH/PCFIC Reference mea defined in A.3.1	surement channel			R.6 TDI)		R.6 TDI)		R.6 TDI)
OCNG Patterns A.3.2.2.1 (OP.1 A.3.2.2.2 (OP.2	TDD) and		OP. 1 TDD	OP. 2 TDD	OP.2 TDD	OP. 1 TDD	OP. 2 TDD	OP.2 TDD	OP. 1 TDD	OP. 2 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB		dB	Note 6		0	Note 6		0	Note 6		0
$N_{oc}^{ m Note2}$	Bands TDD_A Bands TDD_C	dBm/ 15 kHz	-84.76			-103.85			-116 -115		
CRS \hat{E}_s/N_{oc}	Bands TDD_E	dB	4	2	-1.5	4	2	-1.5	4	-114 2	-4
CRS (\hat{E}_s/I_{ot})		dB	- 1.18	- 0.32	-6.96	- 1.18	- 0.32	-6.96	- 0.75	0.54	-9.46
RSRP ^{Note3,4,5}	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/ 15 kHz	- 80.7 6	82.7 6	- 86.2 6	- 99.8 5	- 101. 85	- 105. 35	-112 -111 -110	-114 -113 -112	-120 -119 -118
(RSRQ) _{meas} Note3,4,5	Bands TDD_A, TDD_C, TDD_E	dB	- 14.4 3	- 11.5 9	- 15.0 9	- 14.4 3	- 11.5 9	- 15.0 9	- 14.1 9	- 10.8 1	- 16.8 1
	Bands TDD_A							- 80.8 2	-85.03		
$(Io)_{meas}^{Note3}$	Bands TDD_C	dBm/ 9 MHz	- 49.3 4	-53	-53.19		-72	-72.28		-84	1.03
	Bands TDD_E								- 78.8 2	-83	3.04
Propagation co	ndition	-		AWGN			AWGN			AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant
	over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be
	fulfilled. Applies to all subframes.
Note 3:	RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
Note 7:	E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.16.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Clause 9.1.5.3.

A.9.2.17 FDD Intra frequency case for 5 MHz bandwidth

A.9.2.17.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.1.5.1.

A.9.2.17.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement is tested by using the parameters in Table A.9.2.17.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.17.2-1: RSRQ FDD Intra frequency test parameters, 5MHz

David		l limit	Tes	st 1	Tes	st 2	Test 3		
	ameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
E-UTRA RF Channel	Number			1		1		1	
BW _{channel}		MHz	;	5		5		5	
Measurement bandw		n_{PRB}		– 15	10-	–15	10—15		
PDSCH Reference m defined in A.3.1.1.1	PDSCH Reference measurement channel defined in A.3.1.1.1		R.5 FDD	-	R.5 FDD	-	R.5 FDD	-	
PDSCH allocation		n_{PRB}	7—17	-	7—17	-	7—17	-	
PDCCH/PCFICH/PHI			R.11	FDD	R.11	FDD	R.11	FDD	
OCNG Patterns defin (OP.15 FDD) and A.3 PBCH_RA			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	
PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB Note1		dB	0	0	0	0	0	0	
$N_{oc}^{$	Bands FDD_N	dBm/15 kHz	-81	.76	-100	0.85	-109.5		
\hat{E}_{s}/I_{ot}		dB	-1.76	-1.76	-4.70	-4.70	-5.46	-5.46	
RSRP ^{Note3}	Bands FDD_N	dBm/15 kHz	-78.76	-78.76	-103.75	-103.75	-113.50	-113.50	
RSRQ ^{Note3}	Bands FDD_N	dB	-14.77	-14.77	-16.76	-16.76	-17.34	-17.34	
Io ^{Note3}	Bands FDD_N	dBm/4.5 MHz	-50	50.01 -73.01		-82.19			
\hat{E}_s/N_{oc}		dB	3	3	-2.9	-2.9	-4	-4	
Propagation condition		-		'GN	AW		AW		
Note 1: OCNG sha	all be used such that both	n cells are ful	lly allocate	d and a co	nstant total	transmitte	d nower sp	ectral	

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

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

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

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

A.9.2.17.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Clause 9.1.5.1.

A.9.2.18 FDD—FDD Inter frequency case for 5MHz bandwidth

A.9.2.18.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.6.1 and 9.1.6.2.

A.9.2.18.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. Both RSRQ inter frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.2.18.2-1. In all tests, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.18.2-1: RSRQ FDD—FDD Inter frequency test parameters, 5MHz

D		l lmit	Tes	st 1	Tes	st 2	Tes	t 3
Pa	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF C	hannel Number		1	2	1	2	1	2
BW _{channel}		MHz	5	5	5	5	5	5
Gap Pattern Id	<u> </u>		0	-	0	-	0	-
Measurement		n_{PRB}	_	–15 T		–15	10—	-15
channel define	ence measurement ed in A.3.1.1.1		R.5 FDD	-	R.5 FDD	-	R.6 FDD	-
PDSCH alloca	ation	n_{PRB}	7—17	-	7—17	-	7—17	-
PDCCH/PCFI Reference me defined in A.3	asurement channel		R.11	FDD	R.11	FDD	R.11 I	-DD
A.3.2.1.16 (OF	P.15 FDD) and		OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB								
PSS_RA SSS_RA								
PCFICH_RB								
PHICH_RA]						
PHICH_RB		dB	0	0	0	0	0	0
PDCCH_RA		-						
PDCCH_RB		-						
PDSCH_RA PDSCH_RB		-						
OCNG_RA ^{Note}	e1	+						
OCNG_RB ^{Note}	21	-						
OCNO_ND	Bands FDD_A						-119.5	N/A
	Bands FDD_B						-119	N/A
$N_{_{OC}}$ Note2	Bands FDD_C						-118.5	N/A
	Bands FDD_D						-118	N/A
	Bands FDD_E, FDD_F Note 5	dBm/15 kHz	-77	-77	-101.70	-101.70	-117.5	N/A
	Bands FDD_G						-116.5	N/A
	Bands FDD_H						-116	N/A
	Bands FDD_N						- N/A	-113
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	-1.75	-1.75	-4.00	-4.00	-4.00	-4.00
	Bands FDD_A						-123.5	N/A
	Bands FDD_B						-123	N/A
	Bands FDD_C						-122.5	N/A
Neveo	Bands FDD_D						-122	N/A
RSRP ^{Note3}	Bands FDD_E, FDD_F Note 5	dBm/15 kHz	-78.75	-78.75	-105.70	-105.70	-121.5	N/A
	Bands FDD_G						-120.5	N/A
	Bands FDD_H	-					-120 N/A	N/A
	Bands FDD_N						N/A	-117
	Bands FDD_A	1						
	Bands FDD_B Bands FDD_C	1						
	Bands FDD_C Bands FDD D	1						
RSRQ ^{Note3}	Bands FDD F	dB	-14.76	-14.76	-16.25	-16.25	-16.25	-16.25
	FDD_F Note 5						. 0.20	
	Bands FDD_G	-						
	Bands FDD_H	-						
-	Bands FDD_N Bands FDD_A						-93.27	N/A
	Bands FDD_B	1					-93.27 -92.77	N/A N/A
Note 2	Bands FDD_C	dRm/4 5					-92.77 -92.27	N/A N/A
Io ^{Note3}	Bands FDD_C Bands FDD_D	dBm/4.5 MHz	-50.01	-50.01	-75.47	-75.47	-92.27 -91.77	N/A N/A
	Bands FDD F.	1						
	FDD_F Note 5						-91.27	N/A

	Bands FDD_G						-90.27	N/A	
	Bands FDD_H						-89.77	N/A	
	Bands FDD_N						N/A	-86.77	
\hat{E}_s/N_{oc}		dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0	
Propagation	n condition	-	AW	GN	AW	'GN	AWGN		
Note 1:	OCNG shall be used such	n that both cell	s are fully	allocated a	nd a const	ant total tra	nsmitted pov	ver	
	spectral density is achieve	ed for all OFDI	M symbols				·		
Note 2:	Interference from other ce	ells and noise	sources no	t specified	in the test	is assumed	d to be consta	ant over	
				•		M			
	subcarriers and time and	shall be mode	lled as AW	GN of appl	ropriate po	wer for 14	c to be fulfill	ed.	
Note 3:	RSRQ, RSRP and lo leve	ls have been	derived fro	m other par	rameters fo	or informati	on purposes	. They	
	are not settable parameter	ers themselves	i.	·				_	
Note 4:	RSRP and RSRQ minimu			cified assur	ning indep	endent inte	rference and	I noise at	
	each receiver antenna po	•	•						
Note 5:	For Band 26, the tests sh	all be performe	ed with the	assigned E	E-UTRA ch	annel band	dwidth within	865-894	
	MHz.			9					
Note 6:	This test is only applicable	e for testina in	ter-freguen	cy requirer	nents for E	ands FDD	N. Cell 2 is	on the	
	Band under test, and Cell	•	•			•	_	-	

A.9.2.18.3 Test Requirements

Note 7:

The RSRQ measurement accuracy shall fulfil the requirements in Sections 9.1.6.1 and 9.1.6.2.

E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.19 FDD-FDD Inter Frequency WB-RSRQ

A.9.2.19.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [2]. In the test the UE shall also be configured with the *AllowedMeasBandwidth* parameter defined in TS 36.331 [2]. The test shall verify the WB-RSRQ inter frequency absolute accuracy requirements defined in Section 9.1.6.3.

A.9.2.19.2 Test parameters

In this test case the two cells are on two different carrier frequencies and measurement gaps are provided. The WB-RSRQ inter frequency absolute accuracy requirement is tested by using test parameters in Table A.9.2.19.2-1. In the test, Cell 1 is the PCell and Cell 2 the target cell on which the UE shall be ordered to measure WB-RSRQ.

Table A.9.2.19.2-1: WB-RSRQ FDD-FDD Inter frequency test parameters

Por	ameter	Unit	Test 1			
		Unit	Cell 1	Cell 2		
E-UTRA RF Char	nel Number		1	2		
BW _{channel}		MHz	10	10		
Antenna Configur	ation		1x2	1x	2	
Gap Pattern Id			0	-	.	
PBCH_RA		-		C		
PBCH_RB		-		C		
PSS_RA SSS_RA		-		C		
PCFICH_RB		+		0		
PHICH_RA		-		_0		
PHICH_RB		dB	0	_ c		
PDCCH_RA		ub.		_0		
PDCCH_RB					0	
PDSCH_RA		1			0	
PDSCH_RB				_0	•	
OCNG_RA ^{Note1}				_ c	0	
OCNG_RB ^{Note1}				_ c	0	
AllowedMeasBan [2]	dwidth in TS 36.331	RB	6	5	0	
PDSCH Reference channel defined in			R.0 FDD	-		
PDSCH allocation		n_{PRB}	13-36	-		
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD	-		
OCNG Patterns d (OP.1 FDD)	efined in A.3.2.1.1		OP.1 FDD	-		
$I_{ot}^{ m Note2}$	bandwidth	n_{PRB}	0-49	0-21 28-49	22-27	
1 ot		dBm/15 kHz	-94	-87	-110	
\hat{E}_{s}/I_{ot}	bandwidth	$n_{\it PRB}$	0-49	0-21 28-49	22-27	
5 / Ol		dB	-4	-3	20	
RSRP ^{Note3}		dBm/15 kHz	-98	-90		
RSRQ ^{Note3}		dB	-16.25	-		
WB-RSRQ ₀ ^{Note3} in subframe 0		dB	-	-13.68		
WB-RSRQ ₁ ^{Note3} in subframe ≠ 0		dB	-	-13.63		
lo ^{Note3}		dBm/ 9 MHz	-64.76	-		
Io ^{Note3} in symbol 0, 4, 11 of subframe 0		dBm/ 9 MHz	-	-82.38		
Io ^{Note3} in symbol 7 of subframe 0		dBm/ 9 MHz	-	-82.20		
Io ^{Note3} in symbol 0 subframes ≠ 0	, 4, 7, 11 of	dBm/ 9 MHz	-	-82.38		
Propagation cond		-	AWGN	AWGN		
Note 1: OCNG	shall be used such that	Cell 1 is fully	allocated and a co	nstant tota	ı	

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

Note 2: Interference from other cells not specified in the test, assumed to be constant over time and modelled as noise.

Note 3: RSRQ, RSRP, WB-RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. The stated values represent the weighted average over the allowed measurement bandwidth, and the WB-RSRQ values assume averaging over symbols 0, 4, 7 and 11 of the subframe.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: This test case is applicable to all FDD frequency bands except band 31.

A.9.2.19.3 Test Requirements

The WB-RSRQ measurement accuracy for cell 2 shall fulfil the requirements in Section 9.1.6.3, compared with WB-RSRQ₀ or WB-RSRQ₁.

A.9.2.20 TDD—TDD Inter Frequency WB-RSRQ

A.9.2.20.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [2]. In the test the UE shall also be configured with the *AllowedMeasBandwidth* parameter defined in TS 36.331 [2]. The test shall verify the WB-RSRQ inter frequency absolute accuracy requirements defined in Section 9.1.6.3.

A.9.2.20.2 Test parameters

In this test case the two cells are on two different carrier frequencies and measurement gaps are provided. The WB-RSRQ inter frequency absolute accuracy requirement is tested by using test parameters in Table A.9.2.20.2-1. In the test, Cell 1 is the PCell and Cell 2 the target cell on which the UE shall be ordered to measure WB-RSRQ.

Table A.9.2.20.2-1: WB-RSRQ TDD-TDD Inter frequency test parameters

Parameter Unit Test 1						
Parai	neter	Unit	Cell 1	Cell 2		
E-UTRA RF Channe	el Number		1	2		
BW _{channel}	Noto1	MHz	10	10		
Special subframe co	onfiguration Note1		6	6		
Uplink-downlink con			1	1 1		
Antenna Configurati	on		1x2	1x	2	
Gap Pattern Id			0	-		
PBCH_RA PBCH_RB		-		0		
PSS_RA		-		0		
SSS_RA		-		0		
PCFICH_RB				0		
PHICH_RA		1				
PHICH_RB		dB	0	_0	0	
PDCCH_RA				_0	•	
PDCCH_RB				_0	0	
PDSCH_RA				_0	0	
PDSCH_RB					•	
OCNG_RA ^{Note2}					•	
OCNG_RB ^{Note2}				_0	0	
AllowedMeasBandv	vidth in TS 36.331	RB	6	50)	
[2] PDSCH Reference	magguramant					
channel defined in A			R.0 TDD	-		
PDSCH allocation		n_{PRB}	13-36	-		
	PDCCH/PCFICH/PHICH Reference measurement channel defined in		R.6 TDD	-		
OCNG Patterns def (OP.1 TDD)	ned in A.3.2.2.1		OP.1 TDD	-		
$I_{ot}^{ m Note3}$	bandwidth	n_{PRB}	0-49	0-21 28-49	22-27	
Oi .		dBm/15 kHz	-94	-87	-110	
\hat{E}_s/I_{ot}	bandwidth	n_{PRB}	0—49	0-21 28-49	22-27	
		dB	-4	-3	20	
RSRP ^{Note4}		dBm/15 kHz	-98	-90		
RSRQ ^{Note4}		dB	-16.25	-		
WB-RSRQ ₀ ^{Note4} in subframe 0		dB	-	-13.68		
WB-RSRQ ₁ ^{Note4} in subframe ≠ 0		dB	-	-13.63		
lo ^{Note4}		dBm/ 9 MHz	-64.76	-		
Io ^{Note4} in symbol 0, 4, 11 of subframe 0		dBm/ 9 MHz dBm/ 9	-	-82.38		
_	lo ^{Note4} in symbol 7 of subframe 0		-	-82.20		
lo ^{Note4} in symbol 0, 4	1, 7, 11 of	dBm/9	-	-82.38		
subframes ≠ 0		MHz	A)A(O);			
Propagation condition - AWGN AWGN Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and						

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells not specified in the test, assumed to be constant over time and modelled as noise.

Note 4: RSRQ, RSRP, WB-RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. The stated values represent the weighted average over the allowed measurement bandwidth, and the WB-RSRQ values assume averaging over symbols 0, 4, 7 and 11 of the subframe.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

A.9.2.20.3 Test Requirements

The WB-RSRQ measurement accuracy for cell 2 shall fulfil the requirements in Section 9.1.6.3, compared with WB-RSRQ₀ or WB-RSRQ₁.

A.9.2.21 FDD RSRQ for E-UTRAN Carrier Aggregation for 10MHz+5MHz

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink SCell.

A.9.2.21.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.9.2.5.1.

A.9.2.21.2 Test parameters

The parameters of this test are the same as defined in Subclause A.9.2.5.2 except that the values of the parameters in the Table A.9.2.21.2-1 will replace the values of the corresponding parameters in A.9.2.5.2-1.

Table A.9.2.21.2-1: FDD RSRQ Carrier Aggregation test parameters

ameters		Test	1 1	
anictors	Units	Cell 1	Cell 2	Cell 3
BW _{channel_CA} Note 1			Cell 2	
Measurement bandwidth		22-27		-15
ent channel	7.10	R.0 FDD	R.5 FDD	-
	n	13-36	7-17	_
	PRB			
efined in		R.6 FDD	R.11 FDD	
1 (OP.1 FDD), 5 (OP.15 FDD)		OP.1 FDD	OP.15 FDD	OP.16 FDD
Bands		-119.5	-116	-116
Bands FDD_B		-119	-115.5	-115.5
Bands FDD_C		-118.5	-115	-115
Bands FDD_D		-118	-114.5	-114.5
Bands FDD_E, FDD_F	dBm/15 kHz	-117.5	-114	-114
Bands FDD_G		-116.5	-113	-113
Bands FDD_H		-116	-112.5	-112.5
Bands FDD_N		N/A	-109.5	-109.5
Bands FDD_A		-123.5	-120	-120
Bands FDD_B		-123	-119.5	-119.5
Bands FDD_C		-122.5	-119	-119
Bands FDD_D		-122	-118.5	-118.5
Bands FDD_E, FDD_F	dBm/15 kHz	-121.5	-118	-118
Bands FDD_G		-120.5	-117	-117
Bands FDD_H		-120	-116.5	-116.5
Bands FDD_N		N/A	-113.5	-113.5
Bands FDD_A				
Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_E, FDD_F Bands	dB	-16.25	-17.34	-17.34
	ent bandwidth eference ent channel A.3.1.1.1 location CFICH/PHICH measurement efined in tterns defined 1 (OP.1 FDD), (OP.16 FDD) Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_B	Tent bandwidth Interest bandwidth Interest bandwidth Interest channel Interest channel Interest bandwidth Interest channel Interest bandwidth I	MHz	MHz

	Bands				
	FDD_H Bands FDD_N				
	Bands FDD_A	_	-90.26		
	Bands FDD_B		-89.76		
	Bands FDD_C		-89.26		
	Bands FDD_D	dBm/9MHz	-88.76	N,	/A
	Bands FDD_E, FDD_F		-88.26		
	Bands FDD_G		-87.26		
	Bands FDD_H		-86.76		
Io ^{Note2}	Bands FDD_A	dBm/4.5MHz		-88	.67
	Bands FDD B		N/A	-88.17	
	Bands FDD_C			-87	.67
	Bands FDD_D			-87	.17
	Bands FDD_E, FDD_F			-86.67	
	Bands FDD G			-85	.67
	Bands FDD_H			-85.17	
	Bands FDD_N			-82	.17
Note 1:	This test verifies channel bandwic	th and is perfor			
Note 2:	defined in sectio RSRQ, RSRP ar parameters for in	nd lo levels have nformation purpo			
Note 3:	parameters them See Table A.9.2		ner param	eters	

A.9.2.21.3 Test Requirements

The test requirements defined in section A.9.2.5.3 shall apply in this test case.

A.9.2.22 TDD RSRQ for E-UTRAN Carrier Aggregation for 10MHz+5MHz

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink SCell.

A.9.2.22.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.9.2.6.1.

A.9.2.22.2 Test parameters

The parameters of this test are the same as defined in Subclause A.9.2.6.2 except that the values of the parameters in the Table A.9.2.22.2-1 will replace the values of the corresponding parameters in A.9.2.6.2-1.

Table A.9.2.22.2-1: TDD RSRQ Carrier Aggregation test parameters

	arameters	Test 1				
1 4.14		Units	Cell 1	Cell 2	Cell 3	
BW _{channel_CA} Note1		MHz	10	5		
Measurement bandwidth		n_{PRB}	22-27	10-15		
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	R.4TDD	-	
PDSCH a	allocation	$n_{\it PRB}$	13-36	7-17	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD	R.1 TD	-	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD), A.3.2.2.9 (OP.9 TDD) and A.3.2.2.10 (OP.10 TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD	
Bands TDD_A Bands TDD_C Bands TDD_E Bands TDD_E		dBm/9MHz	-90.26 -89.26 -88.26	N/A	Ą	
10	Bands TDD_A Bands TDD_C	dBm/4.5MHz	N/A	-88. -87.	67	
Note 1:	Bands TDD_E -86.67 Note 1: This test verifies the RRM requirement which is independent					
of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves						
Note 3:	See Table A.9.2.6	6.2-1 for the other	er parame	ters		

A.9.2.22.3 Test Requirements

The test requirements defined in section A.9.2.6.3 shall apply in this test case.

A.9.2.23 FDD RSRQ for E-UTRA Carrier Aggregation (5MHz + 5MHz bandwidth)

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink SCell.

A.9.2.23.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.9.2.5.1.

A.9.2.23.2 Test parameters

The parameters of this test are the same as defined in Subclause A.9.2.5.2 except that the values of the parameters in the Table A.9.2.23.2-1 will replace the values of the corresponding parameters in A.9.2.5.2-1.

Table A.9.2.23.2-1: FDD RSRQ Carrier Aggregation test parameters

Military Military	Parameters Test 1					
Measurement bandwidth N_{PRB} 10-15 10			Units	Cell 1	Cell 2	
PDSCH Reference measurement channel defined in A.3.1.1.1 PDSCH allocation N _{PRB} 7-17	BW _{channel_CA}		MHz	5		5
Channel defined in A.3.1.1.1 FDD FDD FDD FDD	Measurement bandwidth		$n_{\it PRB}$			10-15
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 OCNG Patterns defined in A.3.2.1.15 (OP.15 FDD) and A.3.2.1.16 (OP.16 FDD) Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_C Ban						N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 CONG Patterns defined in A.3.1.2.1 OCNG Patterns defined in A.3.2.1.15 (OP.15 FDD) and A.3.2.1.16 (OP.16 FDD) Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_B Bands FD	PDSCH allocation		n_{PRB}	7-17	7-17	-
Reference measurement channel defined in A.3.1.2.1 CONG Patterns defined in A.3.2.1.15 (OP.15 FDD) and A.3.2.1.16 (OP.15 FDD) Bands FDD_B Bands	PDCCH/PCFICH	H/PHICH		D 11	D 11	
A.3.2.1.15 (OP.15 FDD) and A.3.2.1.16 (OP.16 FDD) A.3.2.1.16 (OP.16 FDD) Bands FDD_A Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_E FDD_F Bands FDD_B Bands						R.11 FDD
Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E FDD_F Bands FDD_N	A.3.2.1.15 (OP.1	15 FDD) and				OP.16FDD
Bands FDD_C Bands FDD_D Bands FDD_E FDD_F		Bands FDD_A		-119.5	-116	-116
Bands FDD_D Bands FDD_E FDD_F Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands		Bands FDD_B		-119	-115.5	-115.5
Rands FDD_E, FDD_F Bands FDD_G Bands FDD_B Bands FDD_N				-118.5	-115	-115
FDD_F Bands FDD_H Bands FDD_N Bands FDD_A Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_D Bands		Bands FDD_D		-118	-114.5	-114.5
Bands FDD_H Bands FDD_N Bands FDD_A Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_N Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B	$N_{oc}^{ m Note2}$		dBm/15 kHz	-117.5	-114	-114
Bands FDD_N		Bands FDD_G		-116.5		
RSRPNote2 RSRPNote3 RSRPNote3		Bands FDD_H		-116	-112.5	-112.5
RSRPNote2 Bands FDD_B Bands FDD_C Bands FDD_E FDD_F Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD		Bands FDD_N		-113	-109.5	-109.5
RSRP ^{Note2} Bands FDD_C Bands FDD_D Bands FDD_E FDD_F Bands FDD_B Bands FDD_N		Bands FDD_A		-123.5	-120	-120
RSRP ^{Note2} Bands FDD_D Bands FDD_E FDD_F Bands FDD_B Bands FDD_N		Bands FDD_B		-123	-119.5	-119.5
RSRP Sands FDD_E Bands FDD_B Bands FDD_B Bands FDD_N		Bands FDD_C	_	-122.5	-119	-119
FDD_F Bands FDD_G Bands FDD_H Bands FDD_N Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_D Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Note 5 Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Note 5 Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Note 5 Bands FDD_B		Bands FDD_D		-122	-118.5	-118.5
Bands FDD_H Bands FDD_N Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Note 5 Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_B Rote 5 Bands FDD_B Band	RSRP ^{Note2}		dBm/15 kHz	-121.5	-118	-118
Bands FDD_N Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_		Bands FDD_G		-120.5	-117	-117
Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_A Bands FDD_B Bands FDD_B Note 5 Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_		Bands FDD_H		-120	-116.5	-116.5
RSRQ ^{Note2} Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_B B		Bands FDD_N		-117	-113.5	-113.5
RSRQ ^{Note2} Bands FDD_C Bands FDD_D Bands FDD_E FDD_F Bands FDD_B Bands FDD_N		Bands FDD_A				
Bands FDD_D		Bands FDD_B				
Bands FDD_E FDD_F Bands FDD_G Bands FDD_N		Bands FDD_C				
FDD_E, FDD_F Bands FDD_G Bands FDD_A Note 5 Bands FDD_D Bands FDD_C Note 5 Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_C Spote 5 Bands FDD_B Bands FDD_C Spote 5 Bands FDD_B Bands FDD_C Spote 5 Bands FDD_B Bands FDD_C Spote 5 Bands FDD_B Bands FDD_B Spote 5 Bands FDD_B Bands FDD_B Spote 5 Bands FDD_B Bands FDD_B Spote 5 Bands FDD_B Bands FDD_B Spote 5 Bands FDD_		Bands FDD_D				
Bands FDD_G Bands FDD_N Bands FDD_A Bands FDD_B Note 5 Bands FDD_C Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_E FDD_F Note 5 Bands FDD_G Bands FDD_G Bands FDD_H Bands FDD_N	RSRQ ^{Note2}	FDD_E,	dB	-16.25	-17.34	-17.34
Bands FDD_H Bands FDD_N Bands FDD_A Bands FDD_B Note 5 Bands FDD_C Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_E FDD_F Note 5 Bands FDD_G Bands FDD_H Bands FDD_N			4			
Bands FDD_N						
Bands FDD_A -93.26 -88.67						
Note 5		-				
Note 5				-93.26	-88.67	
Note 5	lo ^{Note2}			-92.76	-88.17	
Bands FDD_E, FDD_F Note 5				-92.26	-87.67	
Bands FDD_E, FDD_F Note 5		Bands FDD_D	1	-91.76	-87.17	
Note 5		Bands FDD_E, FDD_F Note 5	dBm/4.5MHz	-91.26	-86.67	
Note 589.76 -85.17		Bands FDD G		-90.26	-85.67	
Bands FDD_N -86.76 -82.76				-89.76	-85.17	
				-86.76	-;	32.76

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section

Note 2: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: See Table A.9.2.5.2-1 for the other parameters

Note 4: E-UTRA operating band groups are as defined in Section 3.5.

Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

A.9.2.23.3 Test Requirements

The test requirements defined in section A.9.2.5.3 shall apply in this test case.

A.9.2.24 TDD RSRQ for E-UTRA Carrier Aggregation (5MHz + 5MHz bandwidth)

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink SCell.

A.9.2.24.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.9.2.6.1.

A.9.2.24.2 Test parameters

The parameters of this test are the same as defined in Subclause A.9.2.6.2 except that the values of the parameters in the Table A.9.2.24.2-1 will replace the values of the corresponding parameters in A.9.2.6.2-1.

Table A.9.2.24.2-1: TDD RSRQ Carrier Aggregation test parameters

Do	rameters	Test 1				
		Units	Cell 1	Cell 2	Cell 3	
BW _{channel_CA} Note1		MHz	10	5	5	
Measurement bandwidth		$n_{\it PRB}$	10-15	10-15	10-15	
PDSCH Reference measurement channel defined in A.3.1.1.1			R.4 TDD	R.4 TDD	N/A	
PDSCH a	llocation	$n_{\it PRB}$	7-17	7-17	N/A	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.11 TDD	R.11 TDD	R.11 TDD	
OCNG Patterns defined in A.3.2.2.9 (OP.9 TDD) and A.3.2.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD	
	Bands TDD_A Note 5		-93.26	-88.67		
lo ^{Note2}	Bands TDD_C Note 5	dBm4.5MHz	-92.26	-87.67		
	Bands TDD_E Note 5		-91.26	-86	.67	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table A.9.2.6.2-1 for the other parameters						
Note 4: E-UTRA operating band groups are as defined in Section 3.5. The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.						

A.9.2.24.3 Test Requirements

The test requirements defined in section A.9.2.6.3 shall apply in this test case.

A.9.2.25 RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD

The test case in this section are applicable to TDD-FDD carrier aggregation capable UEs which have been configured with a downlink SCell.

A.9.2.25.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of RSRQ measurements for the primary component carrier defined in clause 9.1.11.1, the absolute accuracy of RSRQ measurements for the secondary component carrier defined in clause 9.1.11.2, and also the relative RSRQ accuracy requirement between primary and secondary component carriers defined in clause 9.1.11.3.

A.9.2.25.2 Test parameters

In this test case the PCell is FDD and SCell is TDD. Both RSRQ absolute and relative accuracy requirements of the primary and secondary component carrier are tested by using test parameters specified in Table A.9.2.25.2-1. In the test, Cell 1 is the PCell, Cell 2 is the SCell on the Secondary Component Carrier (SCC). The SCC is configured and activated.

The parameters of this test are given in Table A.9.2.25.2-1.

Table A.9.2.25.2-1: RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD test parameters

Pa	arameter	Unit	Cell 1	Cell 2
E-UTRA RF	Channel Number		1	2
BW _{channel}			5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$
Special subf configuration	rame N ^{Note1}		-	6
Uplink-down configuration	link		-	1
Measureme	Measurement bandwidth		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference in A.3.1.1	erence nt channel defined		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD
PDSCH allo		$n_{{\scriptscriptstyle PRB}}$	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
Reference m	FICH/PHICH neasurement ned in A.3.1.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
A.3.2	OCNG Patterns defined in A.3.2		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RB PSS_RA SSS_RA	PSS_RA SSS_RA PCFICH_RB			
PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA	PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA ^{Note2}		0	0
	Bands TDD_A		-	-116
	Bands TDD_C		-	-115
	Bands TDD_E		-	-114
	Bands FDD_A		-119.5	-
N Note3	Bands FDD_B	-ID /4.5 L-I I-	-119 119.5	-
$N_{oc}^{ m Note3}$	Bands FDD_C Bands FDD_D	dBm/15 kHz	-118.5 -118	<u>-</u>
	Bands FDD_E, Bands FDD_F Note 6		-117.5	-
	Bands FDD_G		-116.5	-
	Bands FDD_H		-116	-
\hat{E}_s/N_{oc}		dB	-6.0	-6.0
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-6.0	-6.0
	Bands TDD_A		-	-122
	Bands TDD_C		-	-121
	Bands TDD_E		-	-120
RSRP ^{Note4}	Bands FDD_A	dBm/15 kHz	-125.5	-
	Bands FDD_B		-123	-
	Bands FDD_C		-124.5	-
	Bands FDD_D		-124	-

	Bands FDD_E, Bands FDD_F Note 6		-123.5	-	
	Bands FDD_G		-122.5	-	
	Bands FDD_H		-122	-	
	Bands TDD_A				
	Bands TDD_C		-	-17.77	
	Bands TDD_E				
	Bands FDD_A				
	Bands FDD_B				
RSRQ ^{Note4}	Bands FDD_C	dB			
	Bands FDD_D	-	47.77		
	Bands FDD_E,		-17.77	-	
	Bands FDD_F Note				
	Bands FDD_G				
	Bands FDD_H				
	Bands TDD_A		-	-87.25 +	
	Danco 122			10log(N _{RB,c} /50)	
	Bands TDD_C		-	-86.25 +	
				10log(N _{RB,c} /50)	
	Bands TDD_E	_	-	-85.25 +	
			00 JE .	10log(N _{RB,c} /50)	
	Bands FDD_A		-90.75 +	-	
			10log(N _{RB,} /50)		
	Bands FDD_B		89.76	<u>-</u>	
Io ^{Note4}	Bands FDD_C	dBm/BW _{channel}	-89.75 +	-	
			10log(N _{RB,} /50)		
	Bands FDD_D		-89.25 +	-	
	Bands FDD_E,		10log(N _{RB,} √50)		
	Bands FDD_E, Bands FDD_F Note		-88.75 +	_	
	6		10log(N _{RB,} /50)	_	
	ח ל- רחח ר		-87.75 +		
	Bands FDD_G		10log(N _{RB,} /50)	<u>-</u>	
	Bands FDD H		-87.25 +		
	_		10log(N _{RB,} /50)	<u>-</u>	
Propagation			AWGN	AWGN	
Antenna Co			1x2	1x2	
Timing offse		μs	-	0	
	ent error relative to		-	≤ TAE	
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in					

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate

power for N_{oc} to be fulfilled.

Note 4: Es/lot, RSRP, RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.9.2.25.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in clause 9.1.11.1, 9.1.11.2, and 9.1.11.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 1 on the primary component carrier shall fulfil the requirements specified in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 2 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRQ measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements specified in clause 9.1.11.3.

A.9.2.26 RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD

The test case in this section are applicable to TDD-FDD carrier aggregation capable UEs which have been configured with a downlink SCell.

A.9.2.26.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD measurement accuracy in carrier aggregation is within the specified limits. This test will verify the absolute accuracy of RSRQ measurements for the primary component carrier defined in Clause 9.1.11.1, the absolute accuracy of RSRQ measurements for the secondary component carrier defined in Clause 9.1.11.2, and also the relative RSRQ accuracy requirement between primary and secondary component carriers defined in Clause 9.1.11.3.

A.9.2.26.2 Test parameters

In this test case the PCell is TDD and SCell is FDD. Both RSRQ absolute and relative accuracy requirements of the primary and secondary component carrier are tested by using test parameters specified in Table A.9.2.26.2-1. In the test, Cell 1 is the PCell, Cell 2 is the SCell on the Secondary Component Carrier (SCC). The SCC is configured and activated.

The parameters of this test are given in Table A.9.2.26.2-1.

Table A.9.2.26.2-1: RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD test parameters

Р	arameter	Unit	Cell 1	Cell 2
E-UTRA RF	Channel Number		1	2
BW _{channel}			5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100
Special subt	frame n ^{Note1}		6	-
Uplink-down configuration	nlink		1	-
	nt bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Ref measureme in A.3.1.1	erence nt channel defined		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD
PDSCH allo	cation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
Reference n	FICH/PHICH neasurement ined in A.3.1.2		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patte A.3.2	erns defined in		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD
PHICH_RA PHICH_RB	PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA		0	0
PDSCH_RA PDSCH_RB OCNG_RA ^N OCNG_RB ^N	Note2			
	Bands TDD_A		-119.5	-
	Bands TDD_C		-118.5	-
	Bands TDD_E		-117.5	-
	Bands FDD_A	_	-	-116
λ7 Note3	Bands FDD_B	·	-	-115.5
$N_{oc}^{ m Note3}$	Bands FDD_C	dBm/15 kHz	-	-115 114.5
	Bands FDD_D Bands FDD_E, Bands FDD_F Note 6		-	-114.5 -114
	Bands FDD_G		-	-113
	Bands FDD_H		-	-112.5
\hat{E}_s/N_{oc}		dB	-6.0	-6.0
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-6.0	-6.0
	Bands TDD_A		-125.50	-
	Bands TDD_C]	-124.50	-
	Bands TDD_E		-123.50	-
RSRP ^{Note4}	Bands FDD_A	dBm/15 kHz	-	-122
	Bands FDD_B		-	-119.5
	Bands FDD_C		-	-121
	Bands FDD_D		-	-120.5

	Bands FDD_E, Bands FDD_F Note 6		-	-120		
	Bands FDD_G		-	-119		
	Bands FDD_H		-	-118.5		
	Bands TDD_A					
	Bands TDD_C		-17.77	-		
	Bands TDD_E					
	Bands FDD_A					
	Bands FDD_B					
RSRQ ^{Note4}	Bands FDD_C	dB				
	Bands FDD_D	~ 2				
	Bands FDD_E,		-	-17.77		
	Bands FDD_F					
	Bands FDD_G					
	Bands FDD_H					
	Bands TDD_A		-90.75 +	-		
	_		10log(N _{RB,o} /50) -89.75 +			
	Bands TDD_C		-89.75 + 10log(N _{RB,c} /50)	-		
-			-88.75 +			
	Bands TDD_E		10log(N _{RB,} /50)	-		
	Bands FDD_A		3(ND,0)	-87.25 +		
	Darius FDD_A		•	10log(N _{RB,c} /50)		
	Bands FDD_B			-85.17		
Io ^{Note4}	Bands FDD_C	dBm/BW _{channel}	-	-86.25 +		
	_			10log(N _{RB,} /50) -85.75 +		
	Bands FDD_D		-	10log(N _{RB,c} /50)		
	Bands FDD_E,			-85.25 +		
	Bands FDD_F		-	10log(N _{RB,c} /50)		
	Note o					
	Bands FDD_G		-	-84.25 + 10log(N _{RB,} /50)		
				-83.75 +		
	Bands FDD_H		-	10log(N _{RB,o} /50)		
Propagation Condition			AWGN	AWGN		
Antenna Configuration			1x2	1x2		
Timing offse	et to Cell 1	μѕ	-	0		
Time alignm cell 1 Note 10	nent error relative to		-	≤ TAE		
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in						

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate

power for N_{oc} to be fulfilled.

Note 4: Es/lot, RSRP, RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.9.2.26.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in section 9.1.11.1, 9.1.11.2, and 9.1.11.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 2 on the secondary component carrier shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRQ measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.A.9.2.27 TDD RSRQ for E-UTRAN Carrier Aggregation for 20MHz+10MHz

The test case in this section are applicable to carrier aggregation capable UEs which have been configured with a downlink SCell.

A.9.2.27.1 Test Purpose and Environment

The purpose of this test is the same as defined in Subclause A.9.2.6.1.

A.9.2.27.2 Test parameters

The parameters of this test are the same as defined in Subclause A.9.2.6.2 except that the values of the parameters in the Table A.9.2.27.2-1 will replace the values of the corresponding parameters in A.9.2.6.2-1.

Table A.9.2.27.2-1: TDD RSRQ Carrier Aggregation test parameters

Den			Test 1			
Par	ameters	Units	Cell 1	Cell 2	Cell 3	
BW _{channel_CA}	Note1	MHz	20	1	0	
Measureme	nt bandwidth	$n_{{\scriptscriptstyle PRB}}$	47-52	22	-27	
measureme	PDSCH Reference measurement channel defined in A.3.1.1.2		R.3 TDD	R.0 TDD	-	
PDSCH allo	cation	n_{PRB}	38-61	13-36	-	
Reference n	FICH/PHICH neasurement ned in A.3.1.2.2		R.10 TDD	R.6	TDD	
A.3.2.2.7 (O	P.1 TDD) and		OP.7 TDD	OP.1 TDD	OP.2 TDD	
	Bands TDD_A	ID (4014)	-87.26		//	
	Bands TDD_C	dBm/18MHz	-86.26	N/A		
Io ^{Note2}	Bands TDD_E		-85.26			
	Bands TDD_A			-85	5.67	
	Bands TDD_C	dBm/9MHz	N/A	-84	.67	
Bands TDD_E				-83	3.67	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. Note 2: To levels have been derived from other parameters for information						
p	purposes. They are not settable parameters themselves					

A.9.2.27.3 Test Requirements

The test requirements defined in section A.9.2.6.3 shall apply in this test case.

A.9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal

A.9.2.28.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.1.14.4.

A.9.2.28.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement for Cell 2 is tested by using the parameters in Table A.9.2.28.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell. Cell 2 DMTC configuration is provided to the UE in the *measDS-Config* before the start of the test.

Table A.9.2.28.2-1: RSRQ FDD Intra frequency test parameters

E-UTRA RF Channel Number BWetherment BWAA 10 BWAA		Parameter		Tes	st 1
BW Measurement bandwidth			Unit		
Measurement bandwidth n _{FRB} 22—27 DMTC period ms N/A 160 DMTC period offset ms N/A 10 DMTC period offset ms N/A 1 DMTC period offset ms N/A 1 DBCCH period offset ms N/A 1 DBCCH period offset ms N/A 1 DBCSCH afference measurement channel defined in A.3.1.2.1 R.6 FDD PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 R.6 FDD DCNO CNO CNO CNO CNO CNO CNO CNO CNO CNO		Channel Number			-
DMTC period offset	BW _{channel}		MHz	1	0
DMTC period ms N/A 160 DMTC period offset ms N/A 10 DMTC period offset ms N/A 10 DMTC period offset ms N/A 10 Discovery signal occasion duration ms N/A 1 10 Discovery signal occasion duration ms N/A 1 10 DMTC period offset between cell 1 and cell 2 µs 0 2.3 PDSCH Reference measurement channel defined in R.0 R	Measurement	easurement bandwidth		22-	-27
Discovery signal occasion duration ms N/A 1	DMTC period			N/A	160
Time offset between cell 1 and cell 2 μs 0 2.3 PDSCH Reference measurement channel defined in A.3.1.1.1 R.6 FDD .	DMTC period	offset	ms	N/A	10
DBSCH Reference measurement channel defined in A.3.1.1.1			ms	N/A	1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			μs	1	2.3
PDSCH allocation n pDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 R.6 FDD CONG Patterns defined in A.3.1.2.1 PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.2.1.1 (OP.1 FDD) OP.1 PD OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) OP.1 PD PD.2 FDD And A.3.2.1.2 (OP.2 FDD) FDD FDD PBCH RA PSS RA SSS RA SSS RA SSS RA OP.1 PD PDCH RA PDCCH RB PHICH RB dB 0 0 0 0 0 PDCCH RA PDCCH RB PDCCH RB PDCCH RB PDCCH RB PDCCH RB -1116 -1116 -1115.5 -1116 -1115.5 -1116 -1115.5 -1116 -1115.5		rence measurement channel defined in			-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 OP.1 OP.2 and A.3.2.1.2 (OP.2 FDD) PDC FDD FDD PDC Add A.3.2.1.2 (OP.2 FDD) PDC FDD FDC FDD FDC FDD FDC FDD FDC FDD FDC FDD FD		a tian			
channel defined in A.3.1.2.1 CR.5 FDD OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) OP.1 OP.2 and A.3.2.1.2 (OP.2 FDD) FDD FDD PBCH RA PBCH RB PBCH RB PBCH RB PBCH RB PBCFICH RB PBCFICH RB PHICH RA PHICH RA PHICH RA PBCH RB O 0			n_{PRB}	13—30	-
PBCH_RA	channel defin	ed in A.3.1.2.1		R.6	FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RB PDCCH_RB PDCCH_RB PDCCH_RB PDCCH_RB PDCCH_RB PDSCH_RB PDS					
PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RA PDCCH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB POSCH_RA PDSCH_RB POSCH_RB PO		(01.2100)			100
SSS RA					
PCFICH_RB	PSS_RA				
PHICH_RA					
PHICH_RB					
PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB PDSCH_RB PDSCH_RB PDSCH_RB PDSCH_RB OCNG_RA OCNG_RB OCNG_RB OCNG_RB Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_E, FDD_F Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B					
PDCCH_RB PDSCH_RA PDSCH_RB CONG_RA^Moies1 OCNG_RBNoies1 OCNG_RBNoies2 OCNG_RBNoies3 OCNG_RBNoies5 OCNG_			dB	0	0
PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB Note2					
PDSCH_RB					
OCNG_RR Note2 Bands FDD_A					
Note Bands FDD_B	OCNG PANot	e1			
Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_B Bands FDD_H Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_B Bands					
Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 -111				-1	16
Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 -114.5	- voc				
Bands FDD_D Bands FDD_E, FDD_F Note 5 -114.5 -114 -113 -112.5					
Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H			dBm/15 kHz		
Bands FDD_G Note 7 Bands FDD_H		Bands FDD F FDD F Note 5			
Bands FDD_H Bands FDD_A		Bands FDD G Note 7			
Bands FDD_A		Bands FDD_H		-11	2.5
Bands FDD_A	\hat{E}_{s}/I_{ot}		dB	-5.46	-5.46
Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_B	RSRP ^{Note3}	Bands FDD A		-120	-120
Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_B Bands		Bands FDD_B			-119.5
Bands FDD_E, FDD_F Note 5 -118 -118				-119	-119
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			dBm/15 kHz	-118.5	-118.5
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				 	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	DODONote3			-116.5	-116.5
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	RSRQ				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		_			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			4B	-17 3/	-17 3/
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			uБ	-17.54	-17.54
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		Bands FDD G Note 7			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Io ^{Note3}	_		-85	.67
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		_			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Bands FDD_C		-84	.67
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Bands FDD_D	dBm/9 MHz	-84	.17
Bands FDD_H -82.17 \hat{E}_s/N_{oc} dB -4 -4		Bands FDD_E, FDD_F Note 5		-83	.67
Bands FDD_H -82.17 \hat{E}_s/N_{oc} dB -4 -4		Bands FDD_G Note /			
		Bands FDD_H		-82	.17
Propagation condition - AWGN	\hat{E}_s/N_{oc}		dB	-4	-4
<u> </u>	Propagation of	condition		AW	'GN

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Interference from other cells and noise sources not specified in the test is
	assumed to be constant over subcarriers and time and shall be modelled as
	AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	Except Band 29 and Band 32.

A.9.2.28.3 Test Requirements

The absolute accuracy of RSRQ intra frequency measurement for Cell 2 shall fulfil the requirements in Clause 9.1.14.4.

A.9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal

A.9.2.29.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.1.14.4.

A.9.2.29.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement for Cell 2 is tested by using the parameters in Table A.9.2.29.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell. Cell 2 DMTC configuration is provided to the UE in the *measDS-Config* before the start of the

Table A.9.2.29.2-1: RSRQ TDD Intra frequency test parameters

	Davamatav	l lmi4	Te	est 1	
	Parameter	Unit	Cell 1	Cell 2	
	Channel Number			1	
BW _{channel}	Note1	MHz		10	
Special subfra	ame configuration Note1		6		
Uplink-downlii	nk configuration ^{Note1}			1	
Measurement	bandwidth	n_{PRB}	22	<u>27</u>	
DMTC period		ms	N/A	160	
DMTC period		ms	N/A	10	
	nal occasion duration	ms	N/A	2	
	Time offset between cell 1 and cell 2		0	2.3	
	rence measurement		R.0	_	
	ed in A.3.1.1.2		TDD		
PDSCH alloca		n_{PRB}	13—36	-	
	CH/PHICH Reference channel defined in		D 6	S TDD	
A.3.1.2.2	. Channel defined in		K.C	טטו פ	
	defined in A.3.2.2.1 (OP.1		OP.1	OP.2	
TDD) and A.3.2	2.2.2 (OP.2 TDD)		TDD	TDD	
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB		_			
PHICH_RA	PHICH_RA		0	0	
		dB	U	U	
PDCCH_RA PDCCH_RB					
PDSCH_RA					
PDSCH_RB		┤			
OCNG_RA ^{Note}	e1				
OCNG_RB ^{Note}	e1				
	Bands FDD_A		-116 -115.5		
$N_{oc}^{ m Note2}$	Bands FDD_B	dBm/15			
	Bands FDD_C	kHz	-	115	
	Bands FDD_E		-	114	
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	-5.46	-5.46	
37 00	Bands FDD_A		-120	-120	
DOD E Note3	Bands FDD_B	dBm/15	-119.5	-119.5	
RSRP ^{Note3}	Bands FDD_C	kHz	-119	-119	
	Bands FDD_E		-118	-118	
	Bands FDD_A				
RSRQ ^{Note3}	Bands FDD_B	- 45	47.04	47.04	
KSKQ	Bands FDD_C	dB	-17.34	-17.34	
	Bands FDD_E				
	Bands FDD_A			5.67	
lo ^{Note3} Bands FDD_B		dBm/9		5.17	
.0	Bands FDD_C	MHz	-84.67		
	Bands FDD_E		-8	3.67	
\hat{E}_s/N_{oc}	\hat{E}_s/N_{oc} dB -4 -4				
Propagation of		-		VGN	
Note 1: For special subframe and uplink-downlink configurations see					

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time

the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for

 N_{oc} to be fulfilled.

No	te 4:	RSRQ, RSRP and lo levels have been derived from other
		parameters for information purposes. They are not settable
		parameters themselves.
No	te 5:	RSRP and RSRQ minimum requirements are specified
		assuming independent interference and noise at each receiver
		antenna port.
No	ote 6:	E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.29.3 Test Requirements

The absolute accuracy of RSRQ intra frequency measurement for Cell 2 shall fulfil the requirements in Clause 9.1.14.4.

A.9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal

A.9.2.30.1 Test Purpose and Environment

The purpose of this test is to verify that the absolute and relative accuracy of RSRQ measurement in discovery signal occasions is within the specified limits. This test will verify the requirements in Sections 9.1.14.4.

A.9.2.30.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. Both RSRQ inter frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.2.30.2-1. In all tests, Cell 1 is the PCell and Cell 2 the target cell. For measurement of the carrier frequency of Cell 2, DMTC configuration is provided to the UE in the *measDS-Config* before the start of the test.

Table A.9.2.30.2-1: RSRQ in discovery signal occasions FDD—FDD Inter frequency test parameters

D		1114	Test 1		
Par	ameter	Unit	Cell 1	Cell 2	
E-UTRA RF Chann	el Number		1	2	
BW _{channel}		MHz	10	10	
Gap Pattern Id			0	-	
Gap Offset		ms	9	-	
DMTC period		ms	-	160	
DMTC period offse	t	ms	-	10	
Discovery signal oc		ms	-	1	
Time offset between cell 2 and cell 1		μs		3	
	Measurement bandwidth		22	-27	
PDSCH Reference measurement		n_{PRB}			
channel defined in	A.3.1.1.1		R.0 FDD	-	
PDSCH allocation		n_{PRB}	13-36	-	
PDCCH/PCFICH/P	HICH Reference	PKB			
measurement char			R 6	FDD	
A.3.1.2.1	mor dominod m		14.0	. 55	
OCNG Patterns de	fined in A.3.2.1.1		00 4 500	00.0500	
	3.2.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD	
PBCH_RA	, , , , , , , , , , , , , , , , , , , ,				
PBCH_RB]			
PSS_RA]			
SSS_RA]			
PCFICH_RB		1			
PHICH_RA		1			
PHICH_RB		dB	0	0	
PDCCH_RA		1			
PDCCH_RB	PDCCH_RB				
PDSCH_RA	PDSCH_RA				
PDSCH_RB					
OCNG_RA ^{Note1}					
OCNG_RB ^{Note1}		1			
	Bands FDD_A		-117.5	-117.5	
	Bands FDD_B	1	-117	-117	
	Bands FDD_C	1	-116.5	-116.5	
$N_{_{OC}}^{\mathrm{Note2}}$	Bands FDD_D	dBm/15	-116	-116	
	Bands FDD_E,	kHz	-115.5	-115.5	
	FDD_F Note 5		-110.5	-110.0	
	Bands FDD_G Note 7		-114.5	-114.5	
	Bands FDD_H		-114	-114	
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$		dB	-6	-6	
s / ot	Pondo FDD ^				
	Bands FDD_A	4	-123.5	-123.5	
	Bands FDD_B	4	-123	-123	
	Bands FDD_C	dBm/15	-122.5 -122	-122.5 -122	
RSRP ^{Note3}	Bands FDD_D	_ aBm/15 kHz	-122	-122	
	Bands FDD_E, FDD_F Note 5	NI IZ	-121.5	-121.5	
	Bands FDD_G Note 7	1	-120.5	-120.5	
	Bands FDD_G Bands FDD_H	1	-120.5	-120.5	
	Bands FDD_H		-120	-120	
	Bands FDD_B	1			
	Bands FDD_B Bands FDD_C	1			
Noto2	Bands FDD_C	1			
RSRQ ^{Note3}	Bands FDD_E,	dB	-17.77	-17.77	
	FDD_F Note 5				
	Bands FDD_G Note 7	†			
	Bands FDD_H	1			
	Bands FDD_A		-88.75	-88.75	
	Bands FDD_B		-88.25	-88.25	
Io ^{Note3}	Bands FDD_C	dBm/ 9	-87.75	-87.75	
	Bands FDD_D	MHz	-87.25	-87.25	
	Bands FDD_E,	†	-86.75	-86.75	
L		1	00.70		

	FDD_F Note 5			
	Bands FDD_G Note 7		-85.75	-85.75
	Bands FDD_H		-85.25	-85.25
\hat{E}_s/N_{oc}		dB	-6	-6
Propagat	ion condition	-	AW	GN
Note 1:	OCNG shall be used such that b	ooth cells are	fully allocated and	a constant total
	transmitted power spectral dens			
Note 2:	Interference from other cells and			
	assumed to be constant over su	bcarriers and	l time and shall be r	modelled as
	AWGN of appropriate power for	N_{oc} to be full	filled.	
Note 3:	RSRQ, RSRP and lo levels have			neters for
	information purposes. They are			
Note 4:	RSRP and RSRQ minimum requ			
	interference and noise at each r			
Note 5:	For Band 26, the tests shall be p			ncy of the
	assigned E-UTRA channel band			•
Note 6:	E-UTRA operating band groups	are as define	ed in Section 3.5.	
Note 7:	Except Band 29 and Band 32.			

A.9.2.30.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Sections 9.1.14.4.

A.9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal

A.9.2.31.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy in discovery signal occasions is within the specified limits. This test will verify the requirements in Sections 9.1.14.4.

A.9.2.31.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. Both RSRQ inter frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.2.31.2-1 for TDD configuration 1. In all tests, Cell 1 is the PCell and Cell 2 the target cell. DMTC configuration for Cell 2 is provided to UE in the *measDS-Config* before the start of the test.

Table A 9.2.31.2-1: RSRQ TDD—TDD Inter frequency test parameters for TDD configuration 1

D	arameter	Unit	Tes	st 1
		Unit	Cell 1	Cell 2
E-UTRA RF Chan	nel Number		1	2
BW _{channel}		MHz	10	10
Gap Pattern Id			0	-
Gap Offset DMTC period		me	9 -	160
DMTC period offs	Ω t	ms ms	<u> </u>	100
	Discovery signal occasion duration		_	2
Time offset betwe		ms μs	0	3
Special subframe	configuration Note1	P	(5
Uplink-downlink co	onfiguration Note1		•	1
Measurement ban	dwidth	$n_{\it PRB}$	22-	-27
PDSCH Reference defined in A.3.1.1.	e measurement channel 2		R.0 TDD	-
PDSCH allocation		$n_{\it PRB}$	13—36	-
PDCCH/PCFICH/I	PHICH Reference nnel defined in A.3.1.2.2		R.6	TDD
	efined in A.3.2.2.1 (OP.1		OP.1 TDD	OP.2 TDD
PBCH_RA	2 (01 .2 100)			
PBCH_RB				
_	PSS_RA			
SSS_RA		 - 	0	
PCFICH_RB				
PHICH_RA PHICH_RB		dB		0
PDCCH_RA		uБ		
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA ^{Note2}				
OCNG_RB ^{Note2}				
Note3	Bands TDD_A		-117.50	-117.50
$N_{oc}^{ m \ Note3}$	Bands TDD_C	dBm/15 kHz	-116.50	-116.50
	Bands TDD_E		-115.50	-115.50
\hat{E}_{s}/I_{ot}		dB	-6.0	-6.0
	Bands TDD_A		-123.50	-123.50
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-122.50	-122.50
	Bands TDD_E		-121.50	-121.50
RSRQ ^{Note4}	Bands TDD_A, TDD_C, TDD_E	dB	-17.77	-17.77
Bands TDD_A			-88.75	-88.75
Io ^{Note4}	Bands TDD_C	dBm/9 MHz	-87.75	-87.75
	Bands TDD_E		-86.75	-86.75
\hat{E}_s/N_{oc}		dB	-6.0	-6.0
Propagation cond		-		'GN
Note 1: For spe	cial subframe and uplink-d	lownlink configuration	ns see Tables	4.2-1 and

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as

AWGN of appropriate power for $N_{\it oc}$ to be fulfilled.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent

interference and noise at each receiver antenna port.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.31.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Sections 9.1.14.4.

A.9.2.32 FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal

A.9.2.32.1 Test Purpose and Environment

The purpose of this test is to verify that the FDD RSRQ measurement accuracy for carrier aggregation in CRS based discovery signal is within the specified limits under AWGN propagation conditions. This test will verify the absolute and relative accuracy of intra-frequency RSRQ measurements for the secondary component carrier specified in clause 9.1.15.1.2, and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers specified in clause 9.1.15.1.3.

A.9.2.32.2 Test parameters

In this test case the PCell and the SCell are on different carrier frequencies. There are three cells used in this test case. RSRQ absolute and relative accuracy requirements of the primary and secondary component carrier are tested by using test parameters specified in Table A.9.2.32.2-1. In the test, Cell 1 is the PCell, Cell 2 is the SCell on the Secondary Component Carrier (SCC) and Cell 3 is the neighbouring cell on the SCC. Cell 2 on SCC is configured and activated. Cell 3 DMTC configuration is provided to the UE in the *measDS-Config* before the start of the test.

Table A.9.2.32.2-1: FDD RSRQ Carrier Aggregation Test Parameters

_		Test 1				
Paran	neters	Units	Cell 1	Cell 2	Cell 3	
E-UTRA RF Channel	Number		1	2	2	
BW _{channel_CA}		MHz	10	10	10	
DMTC period			N/A	N/A	160	
DMTC period offset			N/A	N/A	10	
Discovery signal occa			N/A	N/A	1	
Timeing offset to Cell	1	μs	-	0	3	
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1	-	
Measurement bandwid	dth	$n_{\it PRB}$	22—27	22—27	22—27	
PDSCH Reference me defined in A.3.1.1.1	easurement channel		R.0 FDD	R.0 FDD	-	
PDSCH allocation		$n_{\it PRB}$	13—36	13—36	-	
PDCCH/PCFICH/PHIC measurement channe	I defined in A.3.1.2.1		R.6 FDD	R.6FDD	R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD	
PBCH_RA) .Z I DD)		100	100	100	
PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA ^{Note1} OCNG_RB ^{Note1}		dB	0	0	0	
	Bands FDD_A		-119.5	-116	-116	
	Bands FDD_B		-119	-115.5	-115.5	
λ7 Note2	Bands FDD_C	-ID /4.5	-118.5	-115	-115	
$N_{oc}^{$ Note2	Bands FDD_D Bands FDD_E, FDD_F Note 6	dBm/15 kHz	-118 -117.5	-114.5 -114	-114.5 -114	
	Bands FDD_G		-116.5	-113	-113	
	Bands FDD H		-116	-112.5	-112.5	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-4.0	-5.46	-5.46	
	Bands FDD_A		-123.5	-120	-120	
	Bands FDD_B		-123	-119.5	-119.5	
	Bands FDD_C		-122.5	-119	-119	
RSRP ^{Note3}	Bands FDD_D	dBm/15	-122	-118.5	-118.5	
	Bands FDD_E, FDD_F Note 6	kHz	-121.5	-118	-118	
	Bands FDD_G		-120.5	-117	-117	
	Bands FDD_H		-120	-116.5	-116.5	
	Bands FDD_A					
	Bands FDD_B					
RSRQ ^{Note3}	Bands FDD_C	dB	-16.25	-17.34	-17.34	
	Bands FDD_D	40	10.20	17.04	17.04	
	Bands FDD_E, FDD_F Note 6					

	Bands FDD_G					
	Bands FDD_H					
	Bands FDD_A		-90.26	-85.67	-85.67	
	Bands FDD_B		-89.76	-85.17	-85.17	
	Bands FDD_C		-89.26	-84.67	-84.67	
lo ^{Note3}	Bands FDD_D	dBm/9	-88.76	-84.17	-84.17	
10	Bands FDD_E, FDD_F Note 6	MHz	-88.26	-83.67	-83.67	
	Bands FDD_G		-87.26	-82.67	-82.67	
	Bands FDD_H		-86.76	-82.17	-82.17	
\hat{E}_s/N_{oc}		dB	-4.0 -4.0 -4.0			
Propagation condition		-	AWGN			
Note 1:	OCNG shall be used such that both	th cells are fully allocated and a constant total				
	transmitted power spectral density					
Note 2:	Interference from other cells and no					
	be constant over subcarriers and ti	me and shall	be modelled	as AWGN of		
	appropriate power for N_{oc} to be fu	.ICHI				
Note 2						
Note 3:	RSRQ, RSRP and lo levels have b			rameters for i	information	
Note 4:	purposes. They are not settable pa RSRP and RSRQ minimum require			mina indonon	dont	
Note 4.	interference and noise at each rece			ming maepen	dent	
Note 5:	The selection of the bands for testi			ration of the	carrier	
Note 5.	aggregation supported by the UEs	ng depends d	in the coningu	iation of the	Carrier	
Note 6:	For Band 26, the tests shall be per	formed with th	ne carrier fred	nuency of the	assigned	
11010 0.	E-UTRA channel bandwidth within			quority of the	aooigiioa	
Note 7:	This test verifies the RRM requirem			of channel ba	andwidth	
	and is performed according to the					
Note 8:	E-UTRA operating band groups are					

A.9.2.32.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in clause 9.1.15.1.1, 9.1.15.1.2, and 9.1.15.1.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 3 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.15.1.2.
- The relative accuracy of inter-frequency RSRQ measurements between Cell 1 on primary component carriers and Cell 3 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.15.1.3.

A.9.2.33 TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal

A.9.2.33.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD RSRQ measurement accuracy for carrier aggregation in CRS based discovery signal is within the specified limits under AWGN propagation conditions. This test will verify the absolute and relative accuracy of intra-frequency RSRQ measurements for the secondary component carrier specified in clause 9.1.15.1.2, and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers specified in clause 9.1.15.1.3.

A.9.2.33.2 Test parameters

In this test case the PCell and the SCell are on different carrier frequencies. There are three cells used in this test case. RSRQ absolute and relative accuracy requirements of the primary and secondary component carrier are tested by using test parameters specified in Table A.9.2.33.2-1. In the test, Cell 1 is the PCell, Cell 2 is the SCell on the Secondary Component Carrier (SCC) and Cell 3 is the neighbouring cell on the SCC. Cell 2 on SCC is configured and activated. Cell 3 DMTC configuration is provided to the UE in the *measDS-Config* before the start of the test.

Table A.9.2.33.2-1: TDD RSRQ Carrier Aggregation Test Parameters

Para	meter	Unit	Test 1			
		Onit	Cell 1	Cell 2	Cell 3	
E-UTRA RF Char	nel Number		1	2	2	
BW _{channel}		MHz	NI/A	10 N/A	100	
DMTC period offs	ot .		N/A N/A	N/A N/A	160	
Discovery signal of			N/A	N/A N/A	10 2	
Timing offset to co		μs	-	0	3	
· ····································	<u></u>	μο		≤ Time		
Time alignment en and cell 1		-	alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1	-		
Special subframe	configuration Note1			6		
Uplink-downlink c	onfiguration Note 1			1		
Measurement bar	ndwidth	$n_{\it PRB}$		22—27		
PDSCH Reference			R.0 TDD	R.0 TDD	-	
PDSCH allocation		n_{PRB}	13—36	13—36	-	
PDCCH/PCFICH/	PHICH Reference	PRB				
measurement cha			R.6	R.6 TDD	R.6	
A.3.1.2.2			TDD		TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 OP.1 TDD OP.2 TDD			
PBCH_RA				0	0	
PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA		dB	0			
PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA ^{Note2} OCNG_RB ^{Note2}						
$N_{oc\ { m Note3}}$	Bands TDD_A		-119.5	-116	6	
OC NOTES	Bands TDD_C	dBm/15 kHz	-118.5	-115	5	
	Bands TDD_E	<u> </u>	-117.5	-114	1	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-4.0	-5.46	-5.46	
	Bands TDD_A		-123.50	-120	-120	
RSRP ^{Note4}	Bands TDD_C	dBm/15 kHz	-122.50	-119	-119	
	Bands TDD_E	1	-121.50	-118	-118	
RSRQ ^{Note4}	Bands TDD_A, TDD_C, TDD_E	dB	-16.25	-17.3		
	Bands TDD_A		-90.26	-85.6	7	
Io ^{Note4}	Bands TDD_C	dBm/9 MHz	-89.26	-84.6		
_	Bands TDD_E		-88.26	-83.6		
\hat{E}_s/N_{oc}	I	dB	-4.0	-4.0	-4.0	
Propagation cond	ition	-		AWGN		

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled
	as AWGN of appropriate power for $N_{\it oc}$ to be fulfilled.
Note 4:	RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.33.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in clause 9.1.15.1.1, 9.1.15.1.2, and 9.1.15.1.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 3 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.15.1.2.
- The relative accuracy of inter-frequency RSRQ measurements between Cell 1 on primary component carriers and Cell 3 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.15.1.3.

A.9.2.34 FDD—FDD Inter frequency new RSRQ

A.9.2.34.1 Test Purpose and Environment

The purpose of this test is to verify that the absolute accuracy of RSRQ measurement is within the specified limits when measurement configuration message received by the UE contains *measRSRQ-OnAllSymbols-r12* parameter in TS 36.331 [2]. This test will verify the requirements in Sections 9.1.16.

A.9.2.34.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. The new RSRQ inter frequency absolute accuracy requirement is tested by using test parameters in Table A.9.2.34.2-1. In the test, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.34.2-1: New RSRQ FDD—FDD Inter frequency test parameters

Pai	rameter	Unit		st 1
		Oilit	Cell 1	Cell 2
E-UTRA RF Chan	nel Number		1	2
BW _{channel}		MHz	10	10
Gap Pattern Id	ation		0	1x2
Antenna Configura		μS	1x2	
Measurement ban	me offset between cell 2 and cell 1		<u>3</u> 22-27	
PDSCH Reference		$n_{\scriptscriptstyle PRB}$		-2 <i>1</i>
channel defined in			R.0 FDD	-
PDSCH allocation	7	n_{PRB}	_	-
PDCCH/PCFICH/F	PHICH Reference	PRB		
measurement cha			R.6 FDD -	
A.3.1.2.1				
OCNG Patterns de	efined in A.3.2.1.1		OP.1 FDD	_
(OP.1 FDD)			OF.1 FDD	-
PBCH_RA				0
PBCH_RB				0
PSS_RA SSS_RA				0
PCFICH_RB				_∞
PHICH_RA				-∞
PHICH_RA PHICH_RB		dB	0	_∞
PDCCH_RA		<u> </u>		-∞
PDCCH_RB				-∞
PDSCH_RA				-∞
PDSCH_RB				-∞
OCNG_RA ^{Note1}				-∞
OCNG_RB ^{Note1}				-∞
7 Note2	Symbols with CRS,	-ID /4.5	-103.85	-103.85
$I_{ot}^{$	PSS, SSS or PBCH All the other	dBm/15 kHz		
	symbols	KI IZ	-94.75	-94.75
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	c)c.c	dB	-3	-3
$\mathbf{E}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$			-3	-5
RSRP ^{Note3}		dBm/15 kHz	-106.85	-106.85
	Subframe 0		-14.54	-14.54
RSRQ ^{Note3}	Subframes other	dB	-14.14	-14.14
	than 0			
	Subframe 0		-19.57	-19.57
New RSRQ ^{Note3}	Subframe 5 Subframe other than	dB	-20.93	-20.93
	0 or 5		-21.66	-21.66
	Symbol 0/4/11		-75.72	-75.72
lo in subframe	Symbol 1/2/3/12/13	dBm/ 9	-66.97	-66.97
0 ^{Note3}	Symbol 5/6/8/9/10	MHz	-75.81	-75.81
	Symbol 7		-75.52	-75.52
	Symbol 0/4/7/11		-75.72	-75.72
lo in subframe 5 ^{Note3}	Symbol 1/2/3/8/9/10/12/13	dBm/ 9 MHz	-66.97	-66.97
0	Symbol 5/6	IVII IZ	-75.81	-75.81
	Symbol 0/4/7/11		-75.72	-75.72
lo in subframes other than 0 or 5 Note3	Symbol 1/2/3/5/6/8/9/10/12/ 13	dBm/ 9 MHz	-66.97	-66.97
Propagation condi		-	AW	/GN
	shall he used such that h	41 11		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Interference from other cells and noise sources not specified in the test is

Note 2: assumed to be constant over subcarriers and time and shall be modelled as

AWGN of appropriate power for $^{N_{oc}}$ to be fulfilled. RSRQ, RSRP, new RSRQ and lo levels have been derived from other Note 3:

parameters for information purposes. They are not settable parameters themselves. The new RSRQ values assume RSSI averaging over all OFDM symbols of the subframe.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent

interference and noise at each receiver antenna port.

A.9.2.34.3 Test Requirements

The new RSRQ measurement accuracy for cell 2 shall fulfil the requirements in Section 9.1.16, compared with any nominal new RSRQ value in subframe 0, 5 or others.

A.9.2.35 TDD—TDD Inter frequency new RSRQ

A.9.2.35.1 Test Purpose and Environment

The purpose of this test is to verify that the absolute accuracy of RSRQ measurement is within the specified limits when measurement configuration message received by the UE contains *measRSRQ-OnAllSymbols-r12* parameter in TS 36.331 [2]. This test will verify the requirements in Sections 9.1.16.

A.9.2.35.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. The new RSRQ inter frequency absolute accuracy requirement is tested by using test parameters in Table A.9.2.35.2-1. In the test, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.35.2-1: New RSRQ TDD—TDD Inter frequency test parameters

-		11.74	Test 1		
Para	ameter	Unit	Cell 1	Cell 2	
E-UTRA RF Chann	el Number		1 2		
BW _{channel}	r . Note1	MHz	10 10 6 6		
Special subframe of Uplink-downlink co	onfiguration Note1				
Gap Pattern Id	ntiguration		<u>1</u> 0	1	
Antenna Configura	tion		1x2 1x2		
	set between cell 2 and cell 1		3 22-27		
Measurement band		μ s $n_{_{PRB}}$			
PDSCH Reference		TRB	D A TDD		
channel defined in	A.3.1.1.2		R.0 TDD	-	
PDSCH allocation		$n_{_{PRB}}$			
PDCCH/PCFICH/P	HICH Reference		R.6 TDD -		
measurement char	nel defined in		R.6 TDD	-	
A.3.1.2.2			00.1.50		
OCNG Patterns de	fined in A.3.2.2.1		OP.1 TDD -		
(OP.1 TDD) PBCH RA			0		
PBCH_RB				0	
PSS_RA				0	
SSS_RA				0	
PCFICH_RB				-∞	
PHICH_RA				-∞	
PHICH_RB		dB	0	-∞	
PDCCH_RA				-∞	
PDCCH_RB				-∞	
PDSCH_RA				-∞	
OCNG_RA ^{Note1}	PDSCH_RB			-∞	
OCNG_RB ^{Note1}				-∞	
_	Symbols with CRS,		100.05		
$I_{ot}^{$	PSS, SSS or PBCH	dBm/15	-103.85	-103.85	
	All the other	kHz	-94.75	-94.75	
• /	symbols		01.70	0 1.7 0	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-3	-3	
RSRP ^{Note3}		dBm/15 kHz	-106.85	-106.85	
	Subframe 0	KLIZ	-14.54	-14.54	
RSRQ ^{Note3}	Subframes other	dB	-14.14	-14.14	
	than 0 Subframe 0		-20.08	-20.08	
	Subframe 5		-21.31	-21.31	
New RSRQ ^{Note3}	Subframe 1 or 6	dB	-20.82	-20.82	
	Subframe other than 0, 1, 5 or 6		-21.66	-21.66	
	Symbol 0/4/11		-75.72	-75.72	
lo in subframe	Symbol 1/2/3/5/6/12	dBm/ 9	-66.97	-66.97	
0 ^{Note3}	Symbol 8/9/10/13	MHz	-75.81	-75.81	
Ĭ	Symbol 7		-75.52	-75.52	
	Symbol 0/4/7/11		-75.52 -75.72	-75.72	
lo in subframe	Symbol	dBm/ 9			
5 ^{Note3}	1/2/3/5/6/8/9/10/12	MHz	-66.97	-66.97	
	Symbol 13		-75.81	-75.81	
lo in subframe 1	Symbol 0/4/7	dBm/ 9		-75.72	
or 6 ^{Note3}	Symbol 1/3/5/6/8 Symbol 2	0/4/7 1/3/5/6/8		-66.97 -75.81	
	Symbol 0/4/7/11		-75.81 -75.72	-75.72	
lo in subframes other than 0, 1, 5 or 6 Note3	Symbol 1/2/3/5/6/8/9/10/12/ 13	dBm/ 9 MHz	-66.97	-66.97	
Propagation condit	_	-	AW	'GN	

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as
Note 4:	AWGN of appropriate power for N_{oc} to be fulfilled. RSRQ, RSRP, new RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. The new RSRQ values assume RSSI averaging over all OFDM
Note 5:	symbols of the subframe. RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

A.9.2.35.3 Test Requirements

The new RSRQ measurement accuracy for cell 2 shall fulfil the requirements in Section 9.1.16, compared with any nominal new RSRQ value in subframe 0, 5, 1, 6 or others.

A.9.2.36 FDD—FDD Inter frequency RSRQ measured on all OFDM symbols

A.9.2.36.1 Test Purpose and Environment

The purpose of this test is to verify that the absolute accuracy of RSRQ measurement is within the specified limits when measurement configuration message received by the UE contains *measRSRQ-OnAllSymbols-r12* parameter in TS 36.331 [2]. This test will verify the requirements in Section 9.1.16.

A.9.2.3 is also conducted even if UE is capable of measuring RSRQ on all OFDM symbols.

A.9.2.36.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. Both RSRQ measured on all OFDM symbols inter frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.2.36.2-1. In all tests, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.36.2-1: FDD—FDD Inter frequency test parameters

		Tes	o+ 1	
Parameter	Unit	Cell 1	Cell 2	
E-UTRA RF Channel Number		1	2	
BW _{channel}	MHz	10	10	
Gap Pattern Id		0	-	
Antenna Configuration		1x2	1x2	
Time offset between cell 2 and cell 1	μs	3	3	
Measurement bandwidth	n_{PRB}	22-	·27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD	-	
PDSCH allocation	n_{PRB}	13—36	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in	PRB		FDD	
A.3.1.2.1		N.OT DD		
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD	
PBCH_RA	ļ			
PBCH_RB				
PSS_RA	ļ			
SSS_RA	}			
PCFICH_RB PHICH_RA	-			
PHICH_RA	dB	0	0	
PDCCH_RA	I UD	U	U	
PDCCH RB	}			
PDSCH_RA				
PDSCH_RB	ł			
OCNG_RA ^{Note1}	}			
OCNG RB ^{Note1}				
$N_{oc}^{ m Note2}$	dBm/15 kHz	-80	-80	
\hat{E}_{s}/I_{ot}	dB	-1.75	-1.75	
RSRP ^{Note3}	dBm/15 kHz	-81.75	-81.75	
RSRQ ^{Note3}	dB	-14.76	-14.76	
lo ^{Note3}	dBm/ 9 MHz	-50	-50	
\hat{E}_s/N_{oc}	dBm/ 9 MHz	-1.75	-1.75	
Propagation condition	-	AW		
Note 1: OCNG shall be used such that b				
Note 2: Interference from other cells and assumed to be constant over su	d noise sourc	es not specified in t	he test is	
AWGN of appropriate power for Note 3: RSRP, RSRQ and lo levels hav information purposes. They are	e been derive not settable p	ed from other param parameters themsel	ves. The RSRQ	
values assume RSSI averaging Note 4: RSRP and RSRQ minimum req interference and noise at each r	uirements are	specified assumin		

A.9.2.36.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Section 9.1.16.

A.9.2.37 TDD—TDD Inter frequency RSRQ measurement on all OFDM symbols

A.9.2.37.1 Test Purpose and Environment

The purpose of this test is to verify that the absolute accuracy of RSRQ measurement is within the specified limits when measurement configuration message received by the UE contains *measRSRQ-OnAllSymbols-r12* parameter in TS 36.331 [2]. This test will verify the requirements in Section 9.1.16.

A.9.2.4 is also conducted even if UE is capable of measuring RSRQ on all OFDM symbols..

A.9.2.37.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. Both RSRQ measured on all OFDM symbols inter frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.2.37.2-1. In all tests, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.37.2-1: TDD-TDD Inter frequency test parameters

Parameter Unit Test 1			st 1
- 4.4	Unit	Cell 1	Cell 2
E-UTRA RF Channel Number		1	2
BW _{channel}	MHz	10	10
Special subframe configuration Note1		6	6
Uplink-downlink configuration Note1		1	1
Gap Pattern Id		0	-
Antenna Configuration		1x2	1x2
Time offset between cell 2 and cell 1	μs	3	
Measurement bandwidth	$n_{\it PRB}$	22-	-27
PDSCH Reference measurement channel defined in A.3.1.1.2		R.0 TDD	-
PDSCH allocation	n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2	TRB	R.6 TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA]		
PBCH_RB]		
PSS_RA	1		
SSS_RA	1		
PCFICH_RB	1		
PHICH_RA	4D		0
PHICH_RB	dB	0	0
PDCCH_RA	-		
PDCCH_RB	}		
PDSCH_RA PDSCH_RB	}		
OCNG_RA ^{Note1}	1		
OCNG_RB ^{Note1}	1		
	15 //-		
$N_{oc}^{ m Note2}$	dBm/15 kHz	-80	-80
\hat{E}_{s}/I_{ot}	dB	-1.75	-1.75
RSRP ^{Note3}	dBm/15 kHz	-81.75	-81.75
RSRQ ^{Note3}	dB	-14.76	-14.76
Io ^{Note3}	dBm/ 9 MHz	-50	-50
\hat{E}_s/N_{oc}	dBm/ 9 MHz	-1.75	-1.75
Propagation condition	-	AW	GN
Note 1: For special subframe and uplink 4.2-2 in TS 36.211.	-downlink co		
Note 2: OCNG shall be used such that be transmitted power spectral dens			
Note 3: Interference from other cells and assumed to be constant over su	d noise sourc ibcarriers and	es not specified in t d time and shall be r	he test is
AWGN of appropriate power for Note 4: RSRP, RSRQ and lo levels hav information purposes. They are	e been derive not settable p	ed from other param parameters themsel	ves. The RSRQ
values assume RSSI averaging Note 5: RSRP and RSRQ minimum req interference and noise at each r	over all OFD uirements are	M symbols of the se e specified assumin	ubframe.

A.9.2.37.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Section 9.1.16.

A.9.2.38 3 DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation

The test case in this clause is applicable to carrier aggregation capable UEs which have been configured with two downlink SCells.

A.9.2.38.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier specified in clause 9.1.11.1, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier specified in clause 9.1.11.2 and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers specified in clause 9.1.11.3.

A.9.2.38.2 Test parameters

In this set of test cases there are three cells on three carrier frequencies. Cell 1 is PCell on channel 1, Cell 2 is activated SCell on channel 2, and Cell 3 is activated SCell on channel 3. The parameters for the test are listed in Table A.9.2.38.2-1.

Table A.9.2.38.2-1: 3 DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation test parameters (cell #1, cell #2 and cell #3)

Pai	rameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF	Channel Number		1	2	3
BW _{channel}			5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100	5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100	5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100
Special subficonfiguration	Note1		-	6	6
Uplink/downl	link		-	1	1
Measuremer		$n_{{\scriptscriptstyle PRB}}$	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Refe	erence		5MHz: R.5 FDD	5MHz: R.4 TDD	5MHz: R.4 TDD
measuremer			10MHz: R.0 FDD	10MHz: R.0 TDD	10MHz: R.0 TDD
defined in A.	3.1.1		20MHz: R.4 FDD	20MHz: R.3 TDD	20MHz: R.3 TDD
PDSCH alloc	cation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCF	FICH/PHICH		5MHz: R.11 FDD	5MHz: R.11 TDD	5MHz: R.11 TDD
Reference m			10MHz: R.6 FDD 20MHz: R.10 FDD	10MHz: R.6 TDD 20MHz: R.10 TDD	10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patte A.3.2	rns defined in		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH RA					
PHICH_RB		dB	0	0	0
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANG	ote2				
OCNG_RB ^{NO}	ote2				
	Bands TDD_A		-	-116	-116
	Bands TDD_C		-	-115	-115
	Bands TDD_E		-	-114	-114
	Bands FDD_A		-119.5	-	-
	Bands FDD_B		-119	-	-
N Note3	Bands FDD_C	dBm/	-118.5	-	-
$N_{oc}^{ m Note3}$	Bands FDD_D	15kHz	-118	-	-
	Bands FDD_E, Bands FDD_F Note 6		-117.5	-	-
	Bands FDD_G Bands FDD_H		-116.5 -116	-	-
\hat{E}_s/N_{oc}		dB	-6.0	-6.0	-6.0
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-6.0	-6.0	-6.0
	Bands TDD_A		-	-122	-122
	Bands TDD_C		-	-121	-121
Note4	Bands TDD_E	dBm/	-	-120	-120
RSRP ^{Note4}	Bands FDD_A	15kHz	-125.5	-	-
	Bands FDD_B	. 51012	-125	-	-
	Bands FDD_C		-124.5	-	-
	Bands FDD_D		-124	-	-

	1				
	Bands FDD_E, Bands FDD_F		-123.5	-	-
	Bands FDD_G		-122.5	-	-
	Bands FDD H		-122	-	-
	Bands TDD A		,		
	Bands TDD_C		-	-17.77	-17.77
	Bands TDD_E				
	Bands FDD_A				
	Bands FDD_B				
	Bands FDD_C				
RSRQ ^{Note4}	Bands FDD_D	dB			
	Bands		-17.77	_	_
	FDD_E,		-17.77	-	-
	Bands FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
	Bands TDD_A		_	-87.25 +	-87.25 +
	Darius TDD_A		_	10log(N _{RB,} /50)	10log(N _{RB,c} /50)
	Bands TDD_C		-	-86.25 +	-86.25 +
				10log(N _{RB,o} /50)	10log(N _{RB,c} /50)
	Bands TDD_E		-	-85.25 + 10log(N _{RB,} √50)	-85.25 + 10log(N _{RB,} √50)
	Bands FDD_A		-90.75 +	_	_
	Darius i DD_A		10log(N _{RB,c} /50)	_	-
	Bands FDD B		-90.25 +	_	_
	Bando i BB_B		10log(N _{RB,c} /50)		
Io ^{Note4}	Bands FDD C	dBm/	-89.75 +	-	-
		BW _{channel}	10log(N _{RB,c} /50)		
	Bands FDD_D		-89.25 + 10log(N _{RB,o} /50)	-	-
	Bands FDD_E, Bands FDD_F		-88.75 + 10log(N _{RB,c} /50)	-	-
	Bands FDD_G		-87.75 + 10log(N _{RB,c} /50)	-	-
	Bands FDD_H		-87.25 + 10log(N _{RB,c} /50)	-	-
Propagation	Condition		AWGN	AWGN	AWGN
Antenna Con			1x2	1x2	1x2
Timing offset	to Cell 1	μs	-	0	0
Time alignme to cell 1 Note 10	ent error relative		-	≤TAE	≤TAE
	ent error relative		≤TAE	-	≤TAE
Nista de Es		1 10 1		T 11 404 1	4.0.0 % TO 00 044

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $\frac{N_{oc}}{N_{oc}}$ to be

fulfilled.
RSRP, RSRQ and lo levels have been derived from other parameters for information purposes.

They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 4:

Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends

upon the type of carrier aggregation.

A.9.2.38.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in clause 9.1.11.1, 9.1.11.2, and 9.1.11.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 1 on the primary component carrier shall fulfil the requirements specified in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 2 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.11.2
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 3 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.11.2
- The relative accuracy of inter-frequency RSRQ measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements specified in clause 9.1.11.3.
- The relative accuracy of inter-frequency RSRQ measurements between the primary and secondary component carriers for Cell 3 relative to Cell 1 shall fulfil the requirements specified in clause 9.1.11.3.

A.9.2.39 3 DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation

The test case in this clause is applicable to carrier aggregation capable UEs which have been configured with two downlink SCells.

A.9.2.39.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD-FDD RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier defined in Clause 9.1.11.1, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier defined in Clause 9.1.11.2, and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers defined in Clause 9.1.11.3.

A.9.2.39.2 Test parameters

In this set of cases cell 1 is PCell on the primary component carrier, and cell 2 and cell 3 are activated SCells on secondary component carriers SCC1 and SCC2 respectively. The test parameters for the test are listed in Table A.9.2.39.2-1.

Table A.9.2.39.2-1: 3 Downlink TDD-FDD RSRQ carrier aggregation test parameters with PCell in TDD (cell #1, cell #2 and cell #3)

Pa	rameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Number	Channel		1	2	3
BW _{channel}			5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100
Special subsconfiguration	frame n ^{Note1}		6	-	-
Uplink/down configuration	nlink		1	-	-
	ent bandwidth	$n_{{\scriptscriptstyle PRB}}$	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Ref measureme defined in A A.3.1.1.2			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD
PDSCH allo		$n_{{\scriptscriptstyle PRB}}$	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
Reference n	FICH/PHICH measurement ined in A.3.1.2.1		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patte A.3.2.1 and	erns defined in A.3.2.2		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RE PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB	A B Note2	dB	0	0	0
	Bands TDD_A		-119.5	-	-
	Bands TDD_C		-118.5	-	-
	Bands TDD_E Bands FDD_A	-	-117.5	- -116	- -116
	Bands FDD_B		-	-115.5	-115.5
Note3	Bands FDD_C	dBm/	-	-115	-115
$N_{oc}^{ m \ Note3}$	Bands FDD_D	15kHz	-	-114.5	-114.5
	Bands FDD_E,				-114
	Bands FDD_F		-	-114	-114
	Bands FDD F		-	-114 -113 -112.5	-114 -113 -112.5
\hat{E}_s/N_{oc}	Bands FDD_F Bands FDD_G	dB	- - -6.0	-113	-113
\hat{E}_s/N_{oc} $\hat{\mathbb{E}}_s/I_{ot}$	Bands FDD_F Note 6 Bands FDD_G Bands FDD_H	dB dB	- -6.0 -6.0	-113 -112.5	-113 -112.5
	Bands FDD_F Note 6 Bands FDD_G Bands FDD_H Bands TDD_A		-6.0 -6.0 -125.50	-113 -112.5 -6.0	-113 -112.5 -6.0 -6.00
	Bands FDD_F Note 6 Bands FDD_G Bands FDD_H Bands TDD_A Bands TDD_C		- -6.0 -6.0 -125.50 -124.50	-113 -112.5 -6.0 -6.00	-113 -112.5 -6.0 -6.00 -
\hat{E}_{s}/I_{ot}	Bands FDD_F Note 6 Bands FDD_G Bands FDD_H Bands TDD_A Bands TDD_C Bands TDD_E		-6.0 -6.0 -125.50	-113 -112.5 -6.0 -6.00 -	-113 -112.5 -6.0 -6.00 -
	Bands FDD_F Note 6 Bands FDD_G Bands FDD_H Bands TDD_A Bands TDD_C Bands TDD_E Bands FDD_A	dB	- -6.0 -6.0 -125.50 -124.50 -123.50	-113 -112.5 -6.0 -6.00 - - - - -	-113 -112.5 -6.0 -6.00 - - - - - -122
\hat{E}_{s}/I_{ot}	Bands FDD_F Note 6 Bands FDD_G Bands FDD_H Bands TDD_A Bands TDD_C Bands TDD_E	dB dBm/	- -6.0 -6.0 -125.50 -124.50	-113 -112.5 -6.0 -6.00 -	-113 -112.5 -6.0 -6.00 -

	Bands FDD_E,			400	400
	Bands FDD_F		-	-120	-120
	Bands FDD_G		-	-119	-119
	Bands FDD H		-	-118.5	-118.5
	Bands TDD_A	dB	-17.77	-	-
ı	Bands TDD_C				
	Bands TDD_E				
	Bands FDD_A		-		-17.77
	Bands FDD_B				
RSRQ ^{Note4}	Bands FDD_C				
RSRQ	Bands FDD_D			-17.77	
	Bands FDD_E,				
	Bands FDD_F				
	Bands FDD_G				
	Bands FDD_H				
	Bands TDD A		-90.75 +	_	_
	Danus TDD_A		10log(N _{RB,c} /50)	-	•
	Bands TDD_C		-89.75 +	_	_
	Danus TDD_C		10log(N _{RB,c} /50)	_	-
	Bands TDD_E		-88.75 + 10log(N _{RB,o} /50)	-	-
	Bands FDD A			-87.25 +	-87.25 +
	Ballus FDD_A		-	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
	Bands FDD_B		-	-86.75 +	-86.75 +
Note 4	Darids 1 DD_D	dBm/ BW _{channel}		10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
Io ^{Note4}	Bands FDD_C		-	-86.25 +	-86.25 +
				10log(N _{RB,c} /50)	10log(N _{RB,} √50)
	Bands FDD_D		-	-85.75 +	-85.75 +
				10log(N _{RB,c} /50)	10log(N _{RB,} √50)
	Bands FDD_E,		-	-85.25 +	-85.25 +
	Bands FDD_F			10log(N _{RB,} √50)	10log(N _{RB,} √50)
		-	-	-84.25 +	-84.25 +
	Bands FDD_G			10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
				-83.75 +	-83.75 +
	Bands FDD_H		-	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		μs	-	0	0
Time alignment error relative to cell 1 Note 10		•		∠ Т ^ ⊏	∠ Т ^ Г
to cell 1 Note 10			-	≤TAE	≤TAE
Time alignment error relative to cell 2 Note 10			≤TAE	-	≤TAE
10 0011 Z				1	

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant N_{cc}

over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP, RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

A.9.2.39.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in clause 9.1.11.1, 9.1.11.2, and 9.1.11.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 1 on the primary component carrier shall fulfil the requirements specified in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 2 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.11.2
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 3 on the secondary component carrier shall fulfil the requirements specified in clause 9.1.11.2
- The relative accuracy of inter-frequency RSRQ measurements between the primary and secondary component carriers for Cell 2 relative to Cell 1 shall fulfil the requirements specified in clause 9.1.11.3.
- The relative accuracy of inter-frequency RSRQ measurements between the primary and secondary component carriers for Cell 3 relative to Cell 1 shall fulfil the requirements specified in clause 9.1.11.3.

A.9.2.40 3 DL FDD RSRQ for E-UTRAN in Carrier Aggregation

A.9.2.40.1 Test Purpose and Environment

The purpose of this test is to verify that the FDD RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier specified in clause 9.1.11.1, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carriers specified in clause 9.1.11.2 and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers specified in clause 9.1.11.3.

A.9.2.40.2 Test parameters

In this test case the PCell and the SCells are on different carrier frequencies. There are three cells used in this test case. Both RSRQ absolute and relative accuracy requirements of the primary and secondary component carriers are tested by using test parameters specified in Table A.9.2.40.2-1. In the test, Cell 1 is the PCell, Cell 2 and Cell 3 are the SCells on secondary component carrier SCC1 and SCC2 respectively. The SCC1 and SCC2 are configured and activated.

Table A.9.2.40.2-1: 3 DL FDD RSRQ carrier aggregation test parameters

PDCCH_RA	Parameter		Unit	Cell 1	Cell 2	Cell 3
MHz	E-UTRA RF Ch	nannel Number		1	2	
Measurement bandwidth n_{RRB} 100 20MHz.Nag_e 100 20MH						
Measurement bandwidth	BW _{channel}		MHz			
Measurement bandwidth n pres 10MHz:22:27 20MHz:47-52 20M						
Description			$n_{\scriptscriptstyle PRR}$			
PDSCH Reference measurement channel defined in A.3.1.1.1	Measurement b	oandwidth				
10MHz:R.0 FDD						
Channel defined in A.3.1.1.1 Change Channel defined in A.3.1.1.1 Change Ch	PDSCH Refere	ence measurement				
Description						
PDSCH allocation		u 1117 (.O. 1 . 1 . 1				
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 SMHz.R.11 FDD SM					-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 5MHz:R.11 FDD	PDSCH allocat	ion	$n_{\scriptscriptstyle PRB}$			
Miles						
Ash						
SMHz:OP.15 FDD						
10MHz:OP.1 FDD 10MHz:OP.1 FDD 20MHz:OP.1 FDD 20MHz:OP.1 FDD 20MHz:OP.11 FD	defined in A.3.	1.2.1				
A.3.2.1	OCNG Patterns	s defined in				
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RB PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RA PDSCH_RB PDSCH_RA PDSCH_RB PDSCH_RA PDSCH_RB PDSCH_RB ROCNG_RB^Noist OCNG_RB^Noist OCNG_RB^Noist OCNG_RB^Noist DEBands FDD_C Bands FDD_C Bands FDD_E FDD_F Noist Bands FDD_H Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B Bands F						
PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RA PDCCH_RA PDCCH_RB PDSCH_RB PDSCH_RB PDSCH_RB PDSCH_RB PDSCH_RB POCNG_RR POCNG_RR POCNG_RR POCNG_RR POCNG_RB PO				ZUMHZ:OP.11 FDD	ZUMHZ:OP.11 FDD	ZUMHZ:OP.11 FDD
PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PHICH_RB PHICH_RB PHICH_RB PDCCH_RA PDCCH_RB PDCCH_RB PDSCH_RB PDSCH_RB PDSCH_RB OCNG_RR POSCH_RB OCNG_RR OCNG_RB OC						
SSS_RA	PBCH_RB					
SSS_RA	PSS_RA					
PFICH_RB						
PHICH_RB						
PHICH_RB						
PDCCH_RA						
PDSCH_RB PDSCH_RB	PHICH_RB		dB	0	0	0
PDSCH_RA	PDCCH_RA					
PDSCH_RB	PDCCH_RB					
PDSCH_RB	PDSCH RA					
DCNG_RA Note1 DCNG_RB Note2 Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_B Bands						
DCNG_RB Note3 Bands FDD_A					!	
Note2 Bands FDD_A Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B	OUNG_RA					
Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D	OCNG_RB	_				
Bands FDD_C Bands FDD_B Bands FDD_B Bands FDD_B			_			-
Note2 Bands FDD_D Bands FDD_E FDD_F Note 6 Bands FDD_G Bands FDD_H dBm/15 kHz -118 -114.5 -114.5 - FDD_F Note 6 Bands FDD_G Bands FDD_H Bands FDD_G Bands FDD_A Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_G Bands FDD_B Bands FDD_B dB -17.77 -17.77 -17.77 -17.77 -17.77 -17.77 -17.77 -17.77 -17.77						
Rands FDD_E, FDD_F Note 6 Bands FDD_B						
FDD_F Note 6 FDD_G Bands FDD_G Bands FDD_H Column	N Note2			-118	-114.5	-114.5
FDD_F Bands FDD_G Bands FDD_H	1 oc	Bands FDD_E,		-117.5	-114	-114
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		Bands FDD_G				
Ê _s /I _{ot} Note3 dB -6.0 -6.0 -6.0 RSRPNote3 Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_B Bands		Bands FDD_H		-116	-112.5	-112.5
Ê _s /I _{ot} Note3 dB -6.0 -6.0 -6.0 RSRPNote3 Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_B Bands	\hat{E} , $/N$.		dB	-6.0	-6.0	-6.0
Bands FDD_A	s/ roc		-			
Bands FDD_A	$\hat{E}_{_{s}}/I_{_{ot}}$ Note3		dB	-6.0	-6.0	-6.0
RSRPNote3 RSRPNOTE3 RSRPNOTE3						
RSRPNote3 RSRPNOTE3 RSRPNOTE3		Bands FDD_A		-125.5		
RSRPNote3 Bands FDD_C Bands FDD_D Bands FDD_E FDD_F Note 6 Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Ba				-125	-121.5	-121.5
Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B				-124.5	-121	-121
### Pands FDD_E, FDD_F Note 6 RHZ	PSPPNote3			-124	-120.5	-120.5
Bands FDD_G Bands FDD_H Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H Bands FDD_H Bands FDD_H Bands FDD_H Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_H	KSKP	Bands FDD_E,		122.5	-120	
Bands FDD_G Bands FDD_H -122 -118.5 Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_G Bands FDD_G Bands FDD_G Bands FDD_G Bands FDD_H						
Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_G Bands FDD_H Bands FDD_H		Bands FDD_G				
RSRQ ^{Note3} Bands FDD_B Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H ABARDS FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_H				-122	-118.5	-118.5
RSRQ ^{Note3}	RSRQ ^{Note3}	Bands FDD_A	- dB			
RSRQ ^{Note3} Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H Bands FDD_H -17.77 -17						
Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H		Bands FDD_C				
Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H						
Bands FDD_G Bands FDD_H		Bands FDD E.				
Bands FDD_G Bands FDD_H		FDD_F Note 6				
Bands FDD_H		Bands FDD_G				
15 Sando 1 DD_11 4D11// 50.701 57.201 507.201	Io ^{Note3} Bands FDD_A		dBm/	-90.75+	-87.25+	-87.25+

	BW _{channel}	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
Panda EDD	D	-90.25+	-86.75+	-86.75+
Bands FDD_	Ь	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
Bands FDD	C	-89.75+	-86.25+	-86.25+
Ballus FDD_	C	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
Bands FDD	n	-89.25+	-85.75+	-85.75+
Ballus FDD_	U	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
Bands FDD_	E,	-88.75+	-85.25+	-85.25+
FDD_F Note 6		10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
Bands FDD	C	-87.75+	-84.25+	-84.25+
Ballus FDD_	G	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
Bands FDD	ц	-87.25+	-83.75+	-83.75+
Ballus FDD_	11	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)
Propagation condition	•	AWGN	AWGN	AWGN
Antenna Configuration	•	1x2	1x2	1x2
Timing offset to Cell 1	μs	-	0	0
Time alignment error relative t cell 1 Note 7		-	≤ TAE	≤TAE
Time alignment error relative t cell 2 Note 7	0	-	-	≤ TAE

- Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.
- Note 3: Es/lot, RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UFs.
- Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 7: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
- Note 8: E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.40.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in clause 9.1.11.1, 9.1.11.2, and 9.1.11.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 3 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRQ measurements between the primary component carrier and SCC1 for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.
- The relative accuracy of inter-frequency RSRQ measurements between the primary component carrier and SCC2 for Cell 3 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.

A.9.2.41 3 DL TDD RSRQ for E-UTRAN in Carrier Aggregation

A.9.2.41.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD RSRQ measurement accuracy in carrier aggregation is within the specified limits in a synchronized network environment with AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier defined in

Clause 9.1.11.1, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carriers defined in Clause 9.1.11.2, and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers defined in Clause 9.1.11.3.

A.9.2.41.2 Test parameters

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is PCell, Cell 2 and Cell 3 are the SCells on secondary component carrier SCC1 and SCC2 respectively. PCell and SCells are in different RF channels. The parameters for the test are listed in Table A.9.2.41.2-1.

Table A.9.2.41.2-1: 3 DL TDD RSRQ carrier aggregation test parameters

Parameter		Unit	Cell 1	Cell2	Cell3	
E-UTRA RF Channel Number			1	2	3	
BW _{channel}		MHz	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$	
Special subfranconfiguration Not	ne e1		6			
Uplink-downlink	configuration Note1					
Measurement b		$n_{{\scriptscriptstyle PRB}}$	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Refere	nce measurement d in A.3.1.1.1		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	
PDSCH allocati	ion	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	
PDCCH/PCFIC			5MHz: R.11 TDD	5MHz:R.11 TDD	5MHz:R.11 TDD	
	surement channel		10MHz: R.6 TDD	10MHz:R.6 TDD	10MHz:R.6 TDD	
defined in A.3.1	1.2.1		20MHz: R.10 TDD 5MHz: OP.9 TDD	20MHz:R.10 TDD 5MHz: OP.9 TDD	20MHz:R.10 TDD 5MHz: OP.9 TDD	
OCNG Patterns A.3.2.1	s defined in		10MHz: OP.1 TDD 20MHz: OP.7 TDD	10MHz: OP.1 TDD 20MHz: OP.7 TDD	10MHz: OP.1 TDD 20MHz: OP.7 TDD	
PBCH_RA			20111121 01 11 122	20111121 01 11 122	20111121 01 17 188	
PBCH_RB						
PSS_RA						
SSS_RA					0	
PCFICH_RB						
PHICH_RA						
PHICH_RB		dB	0	0		
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA ^{Note2}						
OCNG_RB ^{Note2}	_					
a.z. Note3	Bands TDD_A	dBm/15	-119.5	-116	-116	
$N_{oc}^{ m Note3}$	Bands TDD_C Bands TDD_E	kHz	-118.5 -117.5	-115 -114	-115 -114	
\hat{E}_s/N_{oc}	Ballus IDD_E	dB	-6.0	-6.0	-6.0	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}^{\mathrm{Note4}}$		dB	-6.0	-6.0	-6.0	
Note/	Bands TDD_A	dBm/15	-125.5	-122	-122	
RSRP ^{Note4}	Bands TDD_C	kHz	-124.5	-121	-121 120	
	Bands TDD_E		-123.5	-120	-120	
RSRQ ^{Note4}			-17.77	-17.77	-17.77	
	Bands TDD_A		-90.75+ 10log(N _{RB,c} /50)	-87.25+ 10log(N _{RB,c} /50)	-87.25+ 10log(N _{RB,c} /50)	
	Bands TDD_C		-89.75+	-86.25+	-86.25+	
Io ^{Note4}	Dallus IDD_C	dBm/	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	10log(N _{RB,c} /50)	
	Bands TDD_E	BW _{channel}	-88.75+ 10log(N _{RB,c} /50)	-85.25+ 10log(N _{RB,c} /50)	-85.25+ 10log(N _{RB,c} /50)	
Propagation co	ndition	-	AWGN	AWGN	AWGN	
Antenna Config		-	1x2	1x2	1x2	

Timing offset to Cell 1	μs	-	0	0
Time alignment error relative to cell 1 Note 7		-	≤ TAE	≤TAE
Time alignment error relative to cell 2 Note 7		-	-	≤ TAE

- Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
- Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.
- Note 4: Es/lot, RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
- Note 7: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
- Note 8: E-UTRA operating band groups are as defined in Section 3.5.

A.9.2.41.3 Test Requirements

In the test, the RSRQ measurement accuracy in carrier aggregation shall fulfil the requirements in section 9.1.11.1, 9.1.11.2, and 9.1.11.3.

- The absolute accuracy of intra-frequency RSRQ measurements of Cell 1 on the primary component carrier shall fulfil the requirements defined in clause 9.1.11.1.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 2 on SCC1 shall fulfil the requirements defined in clause 9.1.11.2.
- The absolute accuracy of intra-frequency RSRQ measurements of Cell 3 on SCC2 shall fulfil the requirements defined in clause 9.1.11.2.
- The relative accuracy of inter-frequency RSRQ measurements between the primary component carrier and SCC1 for Cell 2 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.
- The relative accuracy of inter-frequency RSRQ measurements between the primary component carrier and SCC2 for Cell 3 relative to Cell 1 shall fulfil the requirements defined in clause 9.1.11.3.

A.9.2.42 FD-FDD RSRQ Intra frequency case for UE category 0

A.9.2.42.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.1.13.3 for FD-FDD intra frequency RSRQ measurements for UE category 0.

A.9.2.42.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement is tested by using the parameters in Table A.9.2.42.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.42.2-1: FD-FDD RSRQ Intra frequency test parameters for UE category 0

_			Tes	st 1	Tes	st 2	Tes	st 3
	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
	nannel Number		•			1		1
BW _{channel}		MHz	1	0	1	0	1	0
Measurement I	bandwidth	$n_{\it PRB}$	22-	–27	22-	–27	22-	–27
PDSCH Refere	ence measurement d in A.3.1.1.3		R.13 FDD	-	R.13 FDD	-	R.13 FDD	-
PDSCH allocat	tion	n_{PRB}	13—36	ı	13—36	-	13—36	1
PDCCH/PCFIC	CH/PHICH asurement channel		R 6	FDD	R 6	FDD	R 6	FDD
defined in A.3.			14.0		14.0	100	14.0	100
OCNG Pattern			OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
A.3.2.1.1 (OP.			FDD	FDD	FDD	FDD	FDD	FDD
A.3.2.1.2 (OP.2 PBCH_RA	2 FUU)							
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB PHICH_RA								
PHICH_RB		dB	0	0	0	0	0	0
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB	1							
OCNG_RA ^{Note}	Ī							
OCNG_NB	Bands FDD_A						-1	16
	Bands FDD_B							5.5
	Bands FDD_C		-84.76		-103.85		-1	15
$N_{oc}^{ m \ Note2}$	Bands FDD_D						-11	4.5
oc	Bands FDD_E, FDD_F Note 5	dBm/15 kHz	-84	.76	-103	3.85	-1	14
	Bands FDD_G						-1	13
	Bands FDD_H						-11	2.5
\hat{E}_s/N_{oc}		dB	3	3	-2.9	-2.9	-4	-4
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
	Bands FDD_A						-120	-120
	Bands FDD_B Bands FDD_C						-119.5 -119	-119.5
	Bands FDD_C Bands FDD_D						-118.5	-119 -118.5
RSRP ^{Note3}	Bands FDD_E, FDD F Note 4	dBm/15 kHz	-81.76	-81.76	-106.75	-106.75	-118	-118
	Bands FDD G						-117	-117
	Note 6 Bands FDD_H						-116.5	-116.5
	Bands FDD_A						1.0.0	
	Bands FDD_B							
	Bands FDD_C							
RSRQ ^{Note3}	Bands FDD_D	dB	-14.77	-14.77	-16.76	-16.76	-17.34	-17.34
NONG	Bands FDD_E, FDD_F Note 45	uБ	- 14.77	-14.77	-10.70	-10.70	-17.54	-17.04
	Bands FDD_G							
	Bands FDD_H							
	Bands FDD_A						-85	.67
Note2	Bands FDD_B						-85	.17
Io ^{Note3}	Bands FDD_C	dBm/9 MHz	-5	50	-7	73		.67
	Bands FDD_D							.17
	Bands FDD_E,						-83	.67

	FDD_F Note 4				
	Bands FDD_G Note 6				-82.67
	Bands FDD_H				-82.17
Propagation co	ndition	-	AWGN	AWGN	AWGN
Correlation Mat	rix and Antenna		1x1	1x1	1x1

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.
- Note 3: Es/lot, RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 5: E-UTRA operating band groups are as defined in Section 3.5.
- Note 6: Except Band 29 and Band 32.

A.9.2.42.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Clause 9.1.13.3.

A.9.2.43 HD-FDD RSRQ Intra frequency case for UE category 0

A.9.2.43.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.1.13.3 for HD-FDD intra frequency RSRQ measurements for UE category 0.

A.9.2.43.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement is tested by using the parameters in Table A.9.2.43.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.43.2-1: HD-FDD RSRQ Intra frequency test parameters for UE category 0

_			Tes	st 1	Tes	st 2	Tes	st 3
Pai	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	nannel Number		,					
BW _{channel}		MHz	1	0	1	0	1	0
Measurement b	andwidth	n	22_	–27	22_	–27	22_	-27
		n_{PRB}						21
	ence measurement		R.1 HD- FDD	-	R.1 HD- FDD	-	R.1 HD- FDD	-
channel define								
PDSCH allocat		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFIC			Dali	- EDD	D 0 1 11		D O LII	
	surement channel		R.3 HI	D-FDD	R.3 HI	D-FDD	R.3 HI	D-FDD
defined in A.3.1								
A.3.2.1.1 (OP.1			OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
A.3.2.1.2 (OP.2			FDD	FDD	FDD	FDD	FDD	FDD
PBCH_RA	,							
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB		dB	0	0	0	0	0	0
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB OCNG_RA ^{NOTE1}								
OCNG_RB ^{Note1}								
OCING_ND	Bands FDD_A						-1	16
	Bands FDD_B						-11	
	Bands FDD_C		-84.76				-1	
λ/ Note2	Bands FDD_D				-103.85			4.5
$N_{oc}^{ m Note2}$	Bands FDD E.	dBm/15 kHz					4	4.4
	FDD_F Note 4						-1	14
	Bands FDD_G						-1	13
							4.4	0.5
<u> </u>	Bands FDD_H						-11	2.5
\hat{E}_s/N_{oc}		dB	3	3	-2.9	-2.9	-4	-4
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
37 00	Bands FDD_A						-120	-120
	Bands FDD_B						-119.5	-119.5
	Bands FDD_C						-119	-119
	Bands FDD_D						-118.5	-118.5
RSRP ^{Note3}	Bands FDD_E,	dBm/15 kHz	-81.76	-81.76	-106.75	-106.75	-118	-118
	FDD_F Note 4							
	Bands FDD_G Note 6						-117	-117
	Bands FDD_H						-116.5	-116.5
	Bands FDD_A							
	Bands FDD_B							
	Bands FDD_C							
Don - Note3	Bands FDD_D				,		,	
RSRQ ^{Note3}	Bands FDD_E, FDD_F Note 4	dB	-14.77	-14.77	-16.76	-16.76	-17.34	-17.34
	Bands FDD_G							
	Note 6							
	Bands FDD_H							
	Bands FDD_A			-		•	-85	.67
Neteo	Bands FDD_B						-85	.17
Io ^{Note3}	Bands FDD_C	dBm/9 MHz	-5	50	-7	'3		.67
	Bands FDD_D							.17
	Bands FDD_E,						-83	.67

	FDD_F Note 4				
	Bands FDD_G Note 6				-82.67
	Bands FDD_H	1			-82.17
Propagation cor	ndition	-	AWGN	AWGN	AWGN
Correlation Mat	rix and Antenna		1x1	1x1	1x1

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.
- Note 3: Es/lot, RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
- Note 5: E-UTRA operating band groups are as defined in Section 3.5.
- Note 6: Except Band 29 and Band 32

A.9.2.43.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Clause 9.1.13.3.

A.9.2.44 TDD RSRQ Intra frequency case for UE category 0

A.9.2.44.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.1.13.3 for TDD intra frequency RSRQ measurements for UE category 0.

A.9.2.44.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement is tested by using the parameters in Table A.9.2.44.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.9.2.44.2-1: TDD RSRQ Intra frequency test parameters for UE category 0

Parameter		l lmit	Test 1		Test 2		Test 3	
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	nannel Number		,		,			1
BW _{channel}		MHz	10		10		10	
Special subfrar configuration No	te1		(6	(6	6	
Uplink-downlinl	k configuration Note1		,	1	,	1	,	1
Measurement b	oandwidth	$n_{{\scriptscriptstyle PRB}}$		–27	22–	–27	22-	–27
PDSCH Refere channel defined	ence measurement d in A.3.1.1.5		R.12 TDD	-	R.12 TDD	-	R.12 TDD	-
PDSCH allocat	ion	n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFIC Reference mea defined in A.3.1	surement channel		R.6	TDD	R.6	TDD	R.6	TDD
OCNG Patterns A.3.2.2.1 (OP.1 A.3.2.2.2 (OP.2	I TDD) and		OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RA OCNG_RA OCNG_RB		dB	0	0	0	0	0	0
$N_{oc}^{ m Note3}$	Bands TDD_C Bands TDD_E	dBm/15 kHz	-84	.76	-103.85		-1	15 14
\hat{E}_s/N_{oc}	Dalius IDD_E	dB	3	3	-2.9	-2.9	-4	-4
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
RSRP ^{Note4}	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-81.76	-81.76	-106.75	-106.75	-120 -119 -118	-120 -119 -118
RSRQ ^{Note4}	Bands TDD_A, TDD_C, TDD_E	dB	-14.77	-14.77	-16.76	-16.76	-17.34	-17.34
lo ^{Note4}	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/9 MHz		50		73	-84 -83	.67 .67
Propagation co		-	AW	'GN	AW	'GN	AW	'GN
Correlation Mar Configuration	trix and Antenna		1)	k 1		κ1	1:	x1

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 4: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

A.9.2.44.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Clause 9.1.13.3.

A.9.3 UTRAN FDD CPICH RSCP

A.9.3.1 E-UTRAN FDD

A.9.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH RSCP absolute measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.2.1. There are two different test setups with different UTRAN parameters.

A.9.3.1.2 Parameters

The test parameters are given in Tables A.9.3.1.2-1, A.9.3.1.2-2 and A.9.3.1.2-3 below.

Table A.9.3.1.2-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH RSCP	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table A.9.3.1.2-2: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2	
E-UTRAN RF Channel Number		1		
BW _{channel}	MHz	10		
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)		OP.1 FDD		

PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 1}	dB	
OCNG_RB ^{Note 1}	dB	
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
\hat{E}_{s}/I_{ot}	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
\hat{E}_s/N_{oc}	dB	4
Propagation Condition		AWGN

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total

transmitted power spectral density is achieved for all OFDM symbols.

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

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

Table A.9.3.1.2-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

	Parameter		Test 1	Test 2
			Cell 2	Cell 2
	CPICH_Ec/lor	dB	-10	-10
	PCCPCH_Ec/lor	dB	-12	-12
	SCH_Ec/lor	dB	-12	-12
	PICH_Ec/lor	dB	-15	-15
	DPCH_Ec/lor	dB	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94
loc	Band I, IV, VI, X, XI, XIX,	dBm/3.84		-94.46
	XXI	MHz		
	Band II, V, VII			-92.46
	Band XXV, XXVI		-60.00	-90.96 (Note 3)
	Band III, VIII, XII, XIII, XIV,			-91.46
	XX, XXII			
	Band IX (Note 2)			-93.46
	Îor/loc	dB	9.54	-9.54
CPICH	Band I, IV, VI, X, XI, XIX,	dBm		-114.0
RSCP,	XXI			
Note 1	Band II, V, VII			-112.0
	Band XXV, XXVI		-60.46	-110.5 (Note 3)
	Band III, VIII, XII, XIII, XIV,			-111.0
	XX, XXII			
	Band IX (Note 2)			-113.0
Io, Note 1	Band I, IV, VI, X, XI, XIX,	dBm/3.84		-94.0
	XXI	MHz		
	Band II, V, VII			-92.0
	Band XXV, XXVI		-50.00	-90.5 (Note 3)
	Band III, VIII, XII, XIII, XIV,			-91.0
	XX, XXII			
	Band IX (Note 2)			-93.0
Pro	opagation condition	-	AWGN	AWGN

NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.3.1.3 Test Requirements

The CPICH RSCP measurement absolute accuracy shall meet the requirements in Clause 9.2.1.

A.9.3.2 E-UTRAN TDD

A.9.3.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH RSCP absolute measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.2.1. There are three different test setups with different UTRAN parameters.

A.9.3.2.2 Parameters

The test parameters are given in Tables A.9.3.2.2-1, A.9.3.2.2-2 and A.9.3.2.2-3 below.

Table A.9.3.2.2-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH RSCP	
Monitored UTRA FDD cell		12	UTRA cells on UTRA RF channel 1
list size			provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table A.9.3.2.2-2: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2
E-UTRAN RF Channel Number		1	
$BW_{channel}$	MHz	10	
Special subframe configuration ^{Note1} Uplink-downlink configuration ^{Note1}		6	
Uplink-downlink configuration Note1		1	
OCNG Patterns defined in A.3.2.2.1		OP.1 TD	ıD.
(OP.1 TDD)		OI.1 1D	יטי

PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 2}	dB	
OCNG_RB ^{Note 2}	dB	
$N_{oc}^{$	dBm/15 kHz	-98
RSRP Note 4	dBm/15 kHz	-94
$\hat{ extbf{E}}_{ ext{s}}/ extbf{I}_{ ext{ot}}$	dB	4
SCH_RP Note 4	dBm/15 kHz	-94
\hat{E}_s/N_{oc}	dB	4
D (1 0 11)		

Propagation Condition AWGN

- Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
- Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.9.3.2.2-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

	Parameter	Unit	Test 1	Test 2
			Cell 2	Cell 2
CPICH_Ec/lor		dB	-10	-10
	PCCPCH_Ec/lor	dB	-12	-12
	SCH_Ec/lor	dB	-12	-12
	PICH_Ec/lor	dB	-15	-15
	DPCH_Ec/lor	dB	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94
loc	Band I, IV, VI, X, XI, XIX,	dBm/3.84		-94.46
	XXI	MHz		
	Band II, V, VII			-92.46
	Band XXV, XXVI		-60.00	-90.96 (Note 3)
	Band III, VIII, XII, XIII, XIV,			-91.46
	XX, XXII			
	Band IX (Note 2)			-93.46
	Îor/loc	dB	9.54	-9.54
CPICH	Band I, IV, VI, X, XI, XIX,	dBm		-114.0
RSCP,	XXI			
Note 1	Band II, V, VII			-112.0
	Band XXV, XXVI		-60.46	-110.5 (Note 3)
	Band III, VIII, XII, XIII, XIV,			-111.0
	XX, XXII			
	Band IX (Note 2)			-113.0
Io, Note 1	Band I, IV, VI, X, XI, XIX,	dBm/3.84		-94.0
	XXI	MHz		
	Band II, V, VII			-92.0
Band XXV, XXVI Band III, VIII, XII, XIII, XIV,			-50.00	-90.5 (Note 3)
				-91.0
	XX, XXII			
	Band IX (Note 2)			-93.0
Pro	opagation condition	-	AWGN	AWGN

NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information purposes.

They are not settable parameters themselves.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.3.2.3 Test Requirements

The CPICH RSCP measurement absolute accuracy shall meet the requirements in Clause 9.2.1.

A.9.3.3 E-UTRAN FDD for 5MHz Bandwidth

A.9.3.3.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.3.1.1.

A.9.3.3.2 Parameters

The parameters of this test are the same as defined in Subclause A.9.3.1.2 except that the values of the parameters in the Table A.9.3.3.2-1 will replace the values of the corresponding parameters in A.9.3.1.2-1, and the values of E-UTRAN FDD cell specific parameters in the Table A.9.3.3.2-2 shall be adopted, and the values of UTRA FDD cell specific parameters shall be reused as defined in Table A.9.3.1.2-3 of Subclause A.9.3.1.2.

Table A.9.3.3.2-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Parameter	Unit	Value	Comment			
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.3.1.1.1			
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.3.1.2.1			
E-UTRAN Channel Bandwidth (BW _{channel})	MHz	5				
Note 1: See Table A.9.3.1.2-1 for other general test parameters.						

Table A.9.3.3.2-2: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Pa	Parameter		Test 1	Test 2	
E-UTRAN RF Channel Number				1	
BW _{channel}		MHz	5		
OCNG Patter			ΛP	15 FDD	
A.3.2.1.15 (O	P.15 FDD)		01.	10100	
PBCH_RA		dB			
PBCH_RB		dB			
PSS_RA		dB			
SSS_RA		dB			
PCFICH_RB		dB			
PHICH_RA		dB			
PHICH_RB		dB		0	
PDCCH_RA		dB			
PDCCH_RB		dB			
PDSCH_RA		dB			
PDSCH_RB		dB			
OCNG_RA ^{Not}	e 1 	dB			
OCNG_RB ^{Not}		dB			
$N_{oc}^{ m Note2}$	Band 31	dBm/15 kHz		-98	
RSRP Note 3	Band 31	dBm/15 kHz		-94	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB		4	
SCH_RP Note 3	Band 31	dBm/15 kHz		-94	
\hat{E}_s/N_{oc}		dB		4	
lo ^{Note3}	Band 31	dBm/4.5 MHz		-67.8	
Propagation (WGN	
	Note 1: OCNG shall be used such that all cells are fully allocated and a constant total				
transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of					
appropriate power for N_{ac} to be fulfilled.					
Note 3: RSRP, SCH_RP and lo levels have been derived from other parameters for					

A.9.3.3.3 Test Requirements

The test requirements defined in section A.9.3.1.3 shall apply to this test case.

information purposes. They are not settable parameters themselves.

A.9.4 UTRAN FDD CPICH Ec/No

A.9.4.1 E-UTRAN FDD

A.9.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH Ec/No absolute measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.2.3. There are three different test setups with different UTRAN parameters.

A.9.4.1.2 Parameters

The test parameters are given in Tables A.9.4.1.2-1, A.9.4.1.2-2 and A.9.4.1.2-3 below.

Table A.9.4.1.2-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table A.9.4.1.2-2: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2	Test 3		
E-UTRAN RF Channel Number		1				
BW _{channel}	MHz		10			
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)			OP.1 FDD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB		0			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note~2}$	dBm/15 kHz		-98			
RSRP Note 3	dBm/15 kHz	-94				
\hat{E}_{s}/I_{ot}	dB	4				
SCH_RP Note 3	dBm/15 kHz	-94				
\hat{E}_s/N_{oc}	dB	4				
Propagation Condition			AWGN			

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

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

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

Table A.9.4.1.2-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

	Parameter		Test 1	Test 2	Test 3
	Parameter	Unit	Cell 2	Cell 2	Cell 2
	CPICH_Ec/lor	dB	-10	-10	-10
P	PCCPCH_Ec/lor	dB	-12	-12	-12
	SCH_Ec/lor	dB	-12	-12	-12
	PICH_Ec/lor	dB	-15	-15	-15
	DPCH_Ec/lor	dB	-	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94	-0.94
	Band I, IV, VI, X, XI, XIX, XXI				-94.46
	Band II, V, VII	dBm/			-92.46
loc	Band XXV, XXVI	3.84	-52.22	-87.27	-90.96 (Note 3)
	Band III, VIII, XII,	MHz			-91.46
	XIII, XIV, XX, XXII				
	Band IX (Note 2)				-93.46
	lor/loc	dB	-1.75	-4.7	-9.54
CP	ICH Ec/Io, Note 1	dBm	-14.0	-16.0	-20.0
	Band I, IV, VI, X,				-94
١.	XI, XIX, XXI	-ID/			-92.0
lo,	Band II, V, VII	dBm/	50	00	
Note 1	Band XXV, XXVI	3.84	-50	-86	-90.5 (Note 3)
'	Band III, VIII, XII,	MHz			-91.0
	XIII, XIV, XX, XXII Band IX (Note 2)				-93
Dro	pagation condition		AWGN	AWGN	AWGN
FIU	payation condition	-	AWGN	AWGN	AWGN

NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.4.1.3 Test Requirements

The CPICH Ec/No measurement absolute accuracy shall meet the requirements in Clause 9.2.3.

The effect of assumed thermal noise and noise generated in the receiver (-99 dBm for frequency bands I, IV, VI, X, XI, XIX and XXI; -98 dBm for frequency band IX, -97dBm for frequency bands II, V and VII; -95.5dBm for frequency band XXV and XXVI; and -96dBm for frequency band III) shall be added into the required accuracy. The test requirements for the absolute CPICH_Ec/Io measurement are shown in Table A.9.4.1.3-1.

Table A.9.4.1.3-1: CPICH Ec/lo absolute accuracy

		Accuracy [dB]	curacy [dB]	
Parameter	Unit	Normal condition	Extreme condition	lo [dBm/3,84 MHz]

ODIOLI Falla		-2.71.5 for -14 ≤ CPICH Ec/lo -3.22 for -16 ≤ CPICH Ec/lo < -14 -4.23 for -20 ≤ CPICH Ec/lo < -16	-4.23	-9487(Band I, IV, VI, X, XI, XIX, XXI) -9285 (Band II, V, VII) -90.583.5 (Band XXV, XXVI (Note 2)) -9184 (Band III, VIII, XII, XIII, XIV, XX, XXII) 9386 (Band IX (Note 1))
CPICH_Ec/lo	dB	± 1.5 for -14 ≤ CPICH Ec/lo ± 2 for -16 ≤ CPICH Ec/lo < -14 ± 3 for -20 ≤ CPICH Ec/lo < -16	± 3	-8750(Band I, IV, VI, X, XI, XIX, XXI) -8550 (Band II, V, VII) -83.550 (Band XXV, XXVI (Note 2)) -8450 (Band III, VIII, XII, XIII, XIV, XX, XXII) -8650 (Band IX (Note 1))

NOTE1: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 2: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

A.9.4.2 E-UTRAN TDD

A.9.4.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH Ec/No absolute measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.2.3. There are three different test setups with different UTRAN parameters.

A.9.4.2.2 Parameters

The test parameters are given in Tables A.9.4.2.2-1, A.9.4.2.2-2 and A.9.4.2.2-3 below.

Table A.9.4.2.2-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.3.1.2.2
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table A.9.4.2.2-2: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	Test 3					
E-UTRAN RF Channel Number		1							
BW _{channel}	MHz		10						
Special subframe configuration Note1			6						
Uplink-downlink configuration Note1			1						
OCNG Patterns defined in			OP.1 TDD						
A.3.2.2.1 (OP.1 TDD)			OP.1 TDD						
PBCH_RA	dB								
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PCFICH_RB	dB								
PHICH_RA	dB								
PHICH_RB	dB		0						
PDCCH_RA	dB								
PDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA ^{Note 2}	dB								
OCNG_RB ^{Note 2}	dB								
$N_{oc}^{ m Note 3}$	dBm/15		-98						
	kHz		-90						
RSRP Note 4	dBm/15		-94						
	kHz		J-T						
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB		4						
SCH_RP Note 4	dBm/15 kHz	-94							
\hat{E}_s/N_{oc}	dB	4					4		
Propagation Condition			AWGN						

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.9.4.2.2-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

	Parameter		Test 1	Test 2	Test 3
		Unit	Cell 2	Cell 2	Cell 2
CPICH_Ec/lor		dB	-10	-10	-10
P	PCCPCH_Ec/lor	dB	-12	-12	-12
	SCH_Ec/lor	dB	-12	-12	-12
	PICH_Ec/lor	dB	-15	-15	-15
	DPCH_Ec/lor	dB	-	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94	-0.94
	Band I, IV, VI, X, XI, XIX, XXI				-94.46
	Band II, V, VII	dBm/			-92.46
loc	Band XXV, XXVI	3.84	-52.22	-87.27	-90.96 (Note 3)
	Band III, VIII, XII,	MHz			-91.46
	XIII, XIV, XX, XXII Band IX (Note 2)				-93.46
	Îor/loc	dB	-1.75	-4.7	-9.54
CP	ICH Ec/Io, Note 1	dBm	-14.0	-16.0	-20.0
	Band I, IV, VI, X, XI, XIX, XXI				-94
lo,	Band II, V, VII	dBm/			-92.0
Note	Band XXV, XXVI	3.84	-50	-86	-90.5 (Note 3)
1	Band III, VIII, XII,	MHz			-91.0
	XIII, XIV, XX, XXII Band IX (Note 2)				-93
Pro	pagation condition	-	AWGN	AWGN	AWGN

NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.4.2.3 Test Requirements

The CPICH Ec/No measurement absolute accuracy shall meet the requirements in Clause 9.2.3.

The effect of assumed thermal noise and noise generated in the receiver (-99 dBm for frequency bands I, IV, VI, X, XI, XIX and XXI; -98 dBm for frequency band IX, -97dBm for frequency bands II, V and VII; -95.5dBm for frequency band XXV and XXVI; and -96dBm for frequency band III) shall be added into the required accuracy. The test requirements for the absolute CPICH_Ec/Io measurement are shown in Table A.9.4.2.3-1.

Table A.9.4.2.3-1: CPICH Ec/lo absolute accuracy

Accuracy [dB]		Accuracy [dB]		Conditions
Parameter	Unit	Normal condition	Extreme condition	lo [dBm/3,84 MHz]

	10	-2.71.5 for -14 ≤ CPICH Ec/lo -3.22 for -16 ≤ CPICH Ec/lo < -14 -4.23 for -20 ≤ CPICH Ec/lo < -16	-4.23	-9487(Band I, IV, VI, X, XI, XIX, XXI) -9285 (Band II, V, VII) -90.583.5 (Band XXV, XXVI (Note 2)) -9184 (Band III, VIII, XII, XIII, XIV, XX, XXII) 9386 (Band IX (Note 1))
CPICH_Ec/lo	dB	± 1.5 for -14 ≤ CPICH Ec/lo ± 2 for -16 ≤ CPICH Ec/lo < -14 ± 3 for -20 ≤ CPICH Ec/lo < -16	± 3	-8750(Band I, IV, VI, X, XI, XIX, XXI) -8550 (Band II, V, VII) -83.550 (Band XXV, XXVI (Note 2)) -8450 (Band III, VIII, XII, XIII, XIV, XX, XXII) -8650 (Band IX (Note 1))

NOTE1: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 2: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

A.9.4.3 E-UTRAN FDD for 5MHz Bandwidth

A.9.4.3.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.4.1.1.

A.9.4.3.2 Parameters

The parameters of this test are the same as defined in Subclause A.9.4.1.2 except that the values of the parameters in the Table A.9.4.3.2-1 will replace the values of the corresponding parameters in A.9.4.1.2-1, and the values of E-UTRAN FDD cell specific parameters in the Table A.9.4.3.2-2 shall be adopted, and the values of UTRA FDD cell specific parameters shall be reused as defined in Table A.9.4.1.2-3 of Subclause A.9.4.1.2.

Table A.9.4.3.2-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Parameter	Unit	Value	Comment			
PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.1			
		Channel R.5 FDD				
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.1			
parameters		Channel R.11 FDD	•			
E-UTRAN Channel	MHz	5				
Bandwidth (BW _{channel})						
Note 1: See Table A.9.4.1.2-1 for other general test parameters.						

Table A.9.4.3.2-2: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Param	eter	Unit	Test 1	Test 2	Test 3		
E-UTRAN RF Ch	annel Number		1				
BW _{channel}		MHz		5			
OCNG Patterns of	defined in			OD 15 EDD			
A.3.2.1.15 (OP.15	5 FDD)		OP.15 FDD				
PBCH_RA		dB					
PBCH_RB		dB					
PSS_RA		dB					
SSS_RA		dB					
PCFICH_RB		dB					
PHICH_RA		dB					
PHICH_RB		dB		0			
PDCCH_RA		dB					
PDCCH_RB		dB					
PDSCH_RA		dB					
PDSCH_RB		dB					
OCNG_RA ^{Note 1}		dB					
OCNG_RB ^{Note 1}		dB					
N_{oc} Note 2	Band 31	dBm/15 kHz		-98			
RSRP Note 3	Band 31	dBm/15 kHz	-94				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB		4			
SCH_RP Note 3	Band 31	dBm/15 kHz		-94			
\hat{E}_s/N_{oc}		dB	4				
Io ^{Note3}	Band 31	dBm/4.5 MHz	-67.8				
Propagation Con-			AWGN				
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total							
transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of							

appropriate power for N_{oc} to be fulfilled.

RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.9.4.3.3 **Test Requirements**

The test requirements defined in section A.9.4.1.3 shall apply to this test case.

UTRAN TDD measurement A.9.5

P-CCPCH RSCP absolute accuracy for E-UTRAN FDD A.9.5.1

A.9.5.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRAN TDD P-CCPCH RSCP measurement absolute accuracy is within the specified limits. This test will verify the requirements in clause 9.3.1 and applies to UE supporting this capability.

Gap pattern configuration with id #1 as specified in Table 8.1.2.1-1 is provided. In the measurement control information it is indicated to the UE that periodic reporting of the UTRA TDD P-CCPCH RSRP measurement is used.

A.9.5.1.2 Test parameters

In this set of test cases there are two cells. Cell 1 is a E-UTRA FDD cell and cell 2 is a UTRA TDD cell. The absolute accuracy of P-CCPCH RSCP measurements are tested by using test parameters in Table A.9.5.1-1, Table A.9.5.1-2, and Table A.9.5.1-3. In all test cases, Cell 1 is the PCell and Cell 2 is the target cell.

Table A.9.5.1-1: General test parameters for UTRA TDD P-CCPCH RSCP measurement absolute accuracy in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.3.1.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		2	One UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BWchannel)	MHz	10	
Active cell		Cell 1	E-UTRAN FDD cell 1 on RF channel number 1
Neighbor cells		Cell 2	1.28Mcps UTRA TDD cell 2 on RF channel number 2
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
CP length of cell 1		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Inter-RAT (UTRAN TDD) measurement quantity		P-CCPCH RSRP	

Table A.9.5.1-2: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 1)

Parameter	Unit	Test 1 Test 2 Test 3		
E-UTRA RF Channel Number		1		
BWchannel	MHz	10		
OCNG Patterns defined in A.3.2.1.1 (OP.1		OP.1 FDD		
FDD)		OP.1 FDD		
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA		0		
PHICH_RB	dB			
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA ^{Note1}				
OCNG_RB ^{Note1}				
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98		
\hat{E}_s / I_{ot}	dB	4		
RSRP ^{Note3}	dBm/15 kHz	-94		
Io ^{Note3}	dBm/9 MHz	-64.76		
\hat{E}_s / N_{oc}	dB	4		
Propagation condition	-	AWGN		

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

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as

AWGN of appropriate power for Note to be fulfilled.

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

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table A.9.5.1-3: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 2)

Parameter	Unit	Tes	Test 1		Test 2		Test 3	
DL timeslot number		0		DwPTS		0	DwPTS	
UTRA RF Channel number Note2		Chan	nel 2	Chan	nel 2	Char	nel 2	
PCCPCH_Ec/lor	dB	-3		-3		-3		
DwPCH_Ec/lor	dB		0		0		0	
OCNS_Ec/lor	dB	-3		-3		-3		
loc	dBm/1.28MHz	-54	1.1	-75	5.2	-6	97	
Îor/loc	dB	2	<u>)</u>		5	()	
PCCPCH RSCP Note1	dBm	-55.1		-73.2		-100		
Io Note1	dBm/1.28MHz	-5	0	-6	69	-6	94	
Propagation condition				AW	GN			

Note 1: PCCPCH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.

A.9.5.1.3 Test Requirements

The UTRA TDD P-CCPCH RSCP measurement accuracy shall meet the requirements in clause 9.3.1.

A.9.5.2 P-CCPCH RSCP absolute accuracy for E-UTRAN TDD

A.9.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRAN TDD P-CCPCH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in clause 9.3.1 and applies to UE supporting this capability.

Gap pattern configuration with id #1 as specified in Table 8.1.2.1-1 is provided. In the measurement control information it is indicated to the UE that periodic reporting of the UTRA TDD P-CCPCH RSRP measurement is used.

A.9.5.2.2 Test parameters

In this set of test cases there are two cells. Cell 1 is a E-UTRA TDD cell and cell 2 is a UTRA TDD cell. The absolute accuracy of P-CCPCH RSCP measurements are tested by using test parameters in Table A.9.5.2-1, Table A.9.5.2-2, and Table A.9.5.2-3. In all test cases, Cell 1 is the PCell and Cell 2 is the target cell.

Table A.9.5.2-1: General test parameters for UTRA TDD P-CCPCH RSCP measurement

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in clause A.3.1.1.2
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2
parameters		Channel R.6 TDD	
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		2	One UTRAN TDD carrier
			frequency is used.
E-UTRAN Channel Bandwidth (BWchannel)	MHz	10	
Active cell		Cell 1	E-UTRA TDD cell1 on RF channel number 1
Neighbour cell		Cell 2	1.28Mcps UTRA TDD Cell2 on RF channel number 2
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	ms	3	Asynchronous cells
Inter-RAT (UTRAN TDD) measurement quantity		P-CCPCH RSCP	

Table A.9.5.2-2: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 1)

Parameter	Unit	Test 1 Test 2 Test 3		
E-UTRA RF Channel Number		1		
BWchannel	MHz	10		
OCNG Patterns defined in A.3.2.2.1 (OP.1		OD 1 TDD		
TDD)		OP.1 TDD		
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB	dB	0		
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA ^{Note1}				
OCNG_RB ^{Note1}				
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98		
\hat{E}_s / I_{ot}	dB	4		
RSRP ^{Note3}	dBm/15 kHz	-94		
Io ^{Note3}	dBm/9 MHz	-64.76		
\hat{E}_s / N_{oc}	dB	4		
Propagation condition	-	AWGN		

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

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

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

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table A.9.5.2-3: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 2)

Parameter	Unit	Tes	Test 1		Test 2		st 3
DL timeslot number		0		DwPTS		0	DwPTS
UTRA RF Channel number Note2		Char	Channel 2 Channel 2		Char	nel 2	
PCCPCH_Ec/lor	dB	-3		-3		-3	
DwPCH_Ec/lor	dB		0		0		0
OCNS_Ec/lor	dB	-3		-3		-3	
loc	dBm/1.28MHz	-54	4.1	-75	5.2	-6	97
Îor/loc	dB	2	2	į	5	()
PCCPCH RSCP Note1	dBm	-55.1		-73.2		-100	
lo Note1	dBm/1.28MHz	-50		-69		-6	94
Propagation condition		AWGN					

Note 1: PCCPCH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.

A.9.5.2.3 Test Requirements

The UTRA TDD P-CCPCH RSCP measurement accuracy shall meet the requirements in clause 9.3.1.

A.9.6 GSM Carrier RSSI

A.9.6.1 E-UTRAN FDD

A.9.6.1.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits when the active cell is E-UTRAN FDD. This test will verify the requirements in clause 9.4.1. There are 12 different test setups with different signal levels for the GSM cells.

Measurement gaps are configured to measure on the GSM cells. Table A.9.6.1.1-2 defines the cell specific test parameters for the E-UTRAN FDD cell. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement is used. The limits of the GSM test parameters in terms of GSM BCCH received level at the receiver inputs are defined in Table A.9.6.1.1-3.

Table A.9.6.1.1-1: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel	As specified in clause A.3.1.1.1.
(E-UTRAN FDD)		R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement Channel	As specified in clause A.3.1.2.1.
parameters		R.6 FDD	
(E-UTRAN FDD)			
Active cell	-	Cell 1	
DRX	-	OFF	
Gap pattern Id		1	As specified in TS 36.133
			clause 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement		GSM Carrier RSSI	
quantity			
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement
			control information

Table A.9.6.1.1.-2: E-UTRAN FDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN FDD

Parameter	Unit	Tests 1-12
E-UTRAN RF Channel Number		1
BW _{channel} OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)	MHz	10 OP.1 FDD

PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	0
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 1}	dB	
OCNG_RB ^{Note 1}	dB	
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
\hat{E}_{s}/I_{ot}	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
\hat{E}_s/N_{oc}	dB	4
Propagation Condition		AWGN

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

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

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

Table A.9.6.1.1-3: BCCH signal levels at receiver input in dBm

Step	BCCH1	BCCH2	ВССН3	BCCH4	BCCH5	ВССН6
1	-38.5	-38.5	NA	NA	NA	NA
2	-48.5	-48.5	NA	NA	NA	NA
3	-70.5	-70.5	NA	NA	NA	NA
4	-109.5	-109.5	NA	NA	NA	NA
5	-57.5	NA	-54.5	NA	NA	NA
6	-64.5	NA	-59.5	NA	NA	NA
7	-71.5	NA	NA	-64.5	NA	NA
8	-78.5	NA	NA	-69.5	NA	NA
9	-85.5	NA	NA	NA	-74.5	NA
10	-92.5	NA	NA	NA	-79.5	NA
11	-99.5	NA	NA	NA	NA	-84.5
12	-106.5	NA	NA	NA	NA	-89.5

A.9.6.1.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in clause 9.4.1.

A.9.6.2 E-UTRAN TDD

A.9.6.2.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits when the active cell is E-UTRAN TDD. This test will verify the requirements in clause 9.4.1. There are 12 different test setups with different signal levels for the GSM cells.

Measurement gaps are configured to measure on the GSM cells. Table A.9.6.2.1-2 defines the cell specific test parameters for the E-UTRAN TDD cell. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement is used. The limits of the GSM test parameters in terms of GSM BCCH received level at the receiver inputs are defined in Table A.9.6.2.1-3.

Table A.9.6.2.1-1: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in clause A.3.1.1.2.
(E-UTRAN TDD)		Channel R.0 TDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in clause A.3.1.2.2.
parameters		Channel R.6 TDD	
(E-UTRAN TDD)			
Active cell		Cell 1	
DRX	-	OFF	
Uplink-downlink		1	As specified in table 4.2.2 in TS
configuration of cell 1			36.211
Special subframe		6	As specified in table 4.2.1 in TS
configuration of cell 1			36.211
Gap pattern Id		1	As specified in TS 36.133
			clause 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement		GSM Carrier RSSI	
quantity			
Monitored cell list size		6 GSM neighbours including	Included in the Measurement
		ARFCN 1	control information

Table A.9.6.2.1-2: E-UTRAN TDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN TDD

Unit	Tests 1 - 12
	4
	1
MHz	10
	OP.1 TDD
	OI .1 100
dB	
dB	0
dB	
dBm/15 kHz	-98
dBm/15 kHz	-94
dB	4
dBm/15 kHz	-94
dB	4
	AWGN
	MHz dB dB dB dB dB dB dB dB dB dB dB dB dB

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

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

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

Table A.9.6.2.1-3: BCCH signal levels at receiver input in dBm

Step	BCCH1	BCCH2	ВССН3	BCCH4	BCCH5	ВССН6
1	-38.5	-38.5	NA	NA	NA	NA
2	-48.5	-48.5	NA	NA	NA	NA
3	-70.5	-70.5	NA	NA	NA	NA
4	-109.5	-109.5	NA	NA	NA	NA
5	-57.5	NA	-54.5	NA	NA	NA
6	-64.5	NA	-59.5	NA	NA	NA
7	-71.5	NA	NA	-64.5	NA	NA
8	-78.5	NA	NA	-69.5	NA	NA
9	-85.5	NA	NA	NA	-74.5	NA
10	-92.5	NA	NA	NA	-79.5	NA
11	-99.5	NA	NA	NA	NA	-84.5
12	-106.5	NA	NA	NA	NA	-89.5

A.9.6.2.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in clause 9.4.1.

A.9.7 UE Rx – Tx Time Difference

A.9.7.1 E-UTRAN FDD UE Rx – Tx time difference case

A.9.7.1.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN FDD UE Rx - Tx time difference measurement accuracy is within the specified limits in Clause 9.1.9.

There is only one active cell in the test. The tested UE is connected with the PCell, configured to transmit SRS signals periodically, and signaled to report UE Rx - Tx time difference measurement. The test equipment measures the transmit timing of the UE using the transmitted SRS, and measures the receive timing using the downlink CRS. The test equipment then compares the difference of these two timings to the UE Rx-Tx measurement reported by the UE.

A.9.7.1.2 Test parameters

The parameters for this test case are defined in Table A.9.7.1.2-1, and the SRS configuration used is defined in Table A.9.7.1.2-2.

Table A.9.7.1.2-1: FDD UE Rx – Tx time difference test parameters

Parameter	Unit	Test 1	Test 2
E-UTRAN RF Channel Number		1	1
BW _{channel}	MHz	1.4	10
DRX		0	FF
PDSCH Reference measurement channel defined in A.3.1.1.1		R.2 FDD	R.0 FDD
PDSCH allocation	$n_{\scriptscriptstyle PRB}$	2—3	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.8 FDD	R.6 FDD
OCNG Patterns defined in A.3.2.1.3 (OP.3 FDD) and A.3.2.1.1 (OP.1 FDD)		OP.3 FDD	OP.1 FDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note1}	dB		
OCNG_RB ^{Note1}	dB		
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98	-98
RSRP Note3	dBm/15 kHz	-101	-101
\hat{E}_s/N_{oc}	dB	-3	-3
lo Note3	dBm/1.08 MHz	-77.66	N/A
	dBm/9 MHz	N/A	-68.45
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	-3	-3
Propagation Condition		AW	/GN
Note 1: OCNC shall be used such that the resources in the active call	ana fullu allagatad an	l	-4-1

Note 1: OCNG shall be used such that the resources in the active cell are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

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

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

Table A.9.7.1.2-2: Sounding Reference Symbol Configuration to be used in FDD UE Rx – Tx time difference test

Field	Test 1	Test 2	Comment		
Field	Val		Comment		
srsBandwidthConfiguration	bw7	bw5			
srsSubframeConfiguration	S	c1			
ackNackSrsSimultaneousTransmission	FAI	LSE			
srsMaxUpPTS	N	/A	Not applicable for FDD		
srsBandwidth	()	No hopping		
srsHoppingBandwidth	hb	w0			
frequencyDomainPosition)			
Duration	TRUE		Indefinite duration		
Srs-ConfigurationIndex	0		SRS periodicity of 2ms for all		
			Tests.		
transmissionComb	()			
cyclicShift	cs0		cs0		No cyclic shift
SRS-AntennaPort	an1		Number of antenna ports used		
			for SRS transmission		
Note: For further information see claus	se 6.3.2 in TS 36	.331.			

A.9.7.1.3 Test Requirements

The UE Rx – Tx time difference measurement accuracy shall fulfill the requirements in Clause 9.1.9.1.

A.9.7.2 E-UTRA TDD

A.9.7.2.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN TDD UE Rx-Tx time difference measurement accuracy is within the specified limits in clause 9.1.9.

There is only one cell in the test. The tested UE is connected with the PCell, configured to transmit SRS signals periodcally, and signaled to report UE Rx - Tx time difference measurement. The test equipment measures the transmit timing of the UE using the transmitted SRS, and measures the receive timing using the downlink CRS. The test equipment then compares the difference of these two timings to the UE Rx - Tx measurement reported by the UE.

A.9.7.2.2 Test parameters

The parameters for this test case are defined in Table A.9.7.2.2-1, and the SRS configuration used is defined in Table A.9.7.2.2-2.

Table A.9.7.2.2-1: Cell specific test parameters for UE Rx-Tx time difference measurement

Parameter	Unit	Tests 1	Tests 2
E-UTRAN RF Channel Number	-	1	1
BW _{channel}	MHz	1.4	10
Uplink-downlink configuration of cell Note1		1	1
Special subframe configuration of cell Note1		6	6
PDSCH Reference measurement channel defined in	-	R.2 TDD	R.0 TDD
A.3.1.1.2			
PDSCH allocation	$n_{\scriptscriptstyle PRB}$	2-3	13-36
PDCCH/PCFICH/PHICH Reference measurement	-	R.8 TDD	R.6 TDD
channel defined in A.3.1.2.2			
OCNG Patterns defined in A.3.2.2.3 (OP.3 TDD) and	-	OP.3 TDD	OP.1 TDD
A.3.2.2.1 (OP.1 TDD)			
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note2}	dB		
OCNG_RB ^{Note2}	dB		
N _{oc} Note 3	dBm/15 kHz	-98	-98
RSRP Note 4	dBm/15 kHz	-101	-101
\hat{E}_s/N_{oc}	dB	-3	-3
lo Note 4	dBm/1.08 MHz	-77.66	N/A
	dBm/9 MHz	N/A	-68.45
$\hat{\mathbf{E}}_{_{\mathrm{s}}}/\mathbf{I}_{_{\mathrm{ot}}}$	dB	-3	-3
Propagation Condition	AWGN		

- Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
- Note 2: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.9.7.2.2-2: Sounding Reference Symbol Configuration to be used in TDD UE Rx – Tx time difference test

Test 1	Test 2	Comment	
Value		Comment	
bw7	bw5		
SC	:1		
FAL	SE		
TR	UE		
()	No hopping	
hb	w0	-	
()		
TR	UE	Indefinite duration	
1	0	SRS periodicity of 10ms for all	
		Tests.	
()		
CS	0	No cyclic shift	
ar	11	Number of antenna ports used	
		for SRS transmission	
	bw7 SC FAL TR (hb) TR 1	Value	

A.9.7.2.3 Test Requirements

The UE Rx – Tx time difference measurement accuracy shall fulfill the requirements in clause 9.1.9.1.

A.9.7.3 E-UTRAN FDD UE Rx–Tx Time Difference under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS

A.9.7.3.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN FDD UE Rx–Tx time difference measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.9.3 when time-domain measurement resource restriction is configured for PCell measurements via higher-layer signalling [2] and non-MBSFN ABS are configured in the interfering cell.

A.9.7.3.2 Test parameters

In this test case, there are two synchronous cells, Cell 1 and Cell 2, on the same RF channel. Cell 1 is the PCell on which UE Rx-Tx is measured, and Cell 2 is the interfering cell. Non-MBSFN ABS pattern is configured in Cell 2 during the entire test.

The tested UE is connected to the PCell and configured to transmit SRS signals periodically. The SRS configuration is provided to the UE before the measurement starts. The UE is configured to report UE Rx–Tx time difference measurement. The test equipment measures the transmit timing of the UE using the transmitted SRS, and measures the receive timing using the downlink CRS. The test equipment then compares the difference of these two timings to the UE Rx-Tx measurement reported by the UE. The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on PCell. The information for both patterns shall be provided to the UE before the measurement starts.

The general and cell-specific parameters for this test case are defined in Table A.9.7.3.2-1 and Table A.9.7.3.2-2, respectively, and the SRS configuration used is specified in Table A.9.7.3.2-3.

Table A.9.7.3.2-1: General test parameters for FDD UE Rx-Tx time difference measurement under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The measured cell
Neighbour cell		Cell 2	The cell interfering to Cell 1
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Downlink Channel Bandwidth (BW _{channel})	MHz	10	For both cells in the test
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells	μs	3	Synchronous cells
Physical cell ID DCI		(PCI _{cell1} - PCI _{cell2})mod6	Cell PCIs for Cell 1 and Cell 2 are selected
Physical cell ID PCI		!=0	randomly so that the condition is met
ABS pattern		'10000000100000001000 0000100000001000000	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod 40 = 0. No MBSFN subframes are cofigured in Cell 1 or Cell 2 during the ABS subframes of Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'1000000010000001000 00001000000010000000	Configured for measurements on Cell 1.

Table A.9.7.3.2-2: Cell-specific test parameters for FDD UE Rx–Tx time difference measurement under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Cell 1	Cell 2
E-UTRAN RF Channel Number		1	1
Channel bandwidth (BW _{channel})	MHz	10	10
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD	N/A
PDSCH allocation	n_{PRB}	13—36	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD	N/A
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.6 (OP.6 FDD)		OP.5 FDD	OP.6 FDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA ^{Note1}	dB		
OCNG_RB ^{Note1}	dB		
N_{oc} Note 2	dBm/15 kHz	-98	-98
${\sf CRS}\hat{E}_s/N_{oc}$	dB	-3	1
CRS $(\hat{E}_s/I_{ot})_{meas}^{Note 3}$	dB	-3	-0.76
CRS $(\hat{E}_{s}/I_{ot})_{nonABS}$ Note 3	dB	-6.54	-0.76
RSRP Note 4	dBm/15 kHz	-101	-97
$({ m Io})_{meas}^{ m Note \ 4}$	dBm/9 MHz	-67.89	-67.89
(Io) _{nonABS} Note 4	dBm/9 MHz	-65.81	-65.81
Propagation condition		AV	/GN

NOTE 1: OCNG shall be used such that the resources in the active cell are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

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

Note 3: $(\hat{E}_s/I_{ot})_{meas}$ is calculated in CRS REs in the subframes indicated for PCell measurements by measurement resource restriction pattern, whilst $(\hat{E}_s/I_{ot})_{nonABS}$ is calculated in CRS REs in the subframes not indicated for PCell measurements by measurement resource restriction paattern.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. ${\rm (Io)}_{meas}$ is calculated in CRS symbols in the subframes indicated for PCell measurements by measurement resource restriction pattern, whilst ${\rm (Io)}_{nonABS}$ is calculated in CRS symbols in the subframes not indicated for PCell measurements by measurement resource restriction pattern.

Table A.9.7.3.2-3: Sounding Reference Symbol Configuration to be used in FDD UE Rx–Tx time difference test

Field	Value	Comment
UL bandwidth	50 RBs	Same as the DL bandwidth
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc1	
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
srs-ConfigIndex	0	SRS periodicity of 2ms
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
srsAntennaPort	an1	Number of SRS antenna ports
Note: For further information see clau	ıse 6.3.2 in TS 36.331.	

A.9.7.3.3 Test Requirements

The UE Rx-Tx time difference measurement accuracy shall fulfill the requirements in Section 9.1.9.3.

A.9.7.4 E-UTRAN TDD UE Rx-Tx Time Difference under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS

A.9.7.4.1 Test Purpose and Environment

The purpose of this test is to verify that the TDD UE Rx-Tx time difference measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.9.3 when time-domain measurement resource restriction is configured for PCell measurements via higher-layer signalling [2] and non-MBSFN ABS are configured in the interfering cell.

A.9.7.4.2 Test Parameters

In the test, there are two synchronous cells, Cell 1 and Cell 2, on the same RF channel. Cell 1 is the PCell on which UE Rx-Tx is measured, and Cell 2 is the interfering cell. Non-MBSFN ABS pattern is configured in Cell 2 during the entire test.

The tested UE is connected to the PCell and configured to transmit SRS signals periodically. The SRS configuration is provided to the UE before the measurement starts. The UE is configured to report UE Rx–Tx time difference measurement. The test equipment measures the transmit timing of the UE using the transmitted SRS, and measures the receive timing using the downlink CRS. The test equipment then compares the difference of these two timings to the UE Rx-Tx measurement reported by the UE. The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD UE Rx-Tx time difference measurements on PCell. The information for both patterns shall be provided to the UE before the measurement starts.

The general and cell-specific parameters for this test case are defined in Table A.9.7.4.2-1 and Table A.9.7.4.2-2, respectively, and the SRS configuration used is defined in Table A.9.7.4.2-3.

Table A.9.7.4.2-1: General test parameters for E-UTRAN TDD UE Rx-Tx time difference measurement under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Cell to be measured
Neighbour cell		Cell 2	The cell interfering to Cell 1
PCell ABS configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Downlink Channel Bandwidth (BW _{channel})	MHz	10	For both cells in the test
CP length		Normal	For both cells in the test
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [16].
DRX			OFF
Time offset between cells	μs	3	Synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6 !=0	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met.
ABS pattern		'00000000010000000001'	Non-MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod 20 = 0. No MBSFN subframes are cofigured in the ABS subframes in Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'000000001000000001'	Configured for measurements on Cell 1.

Table A.9.7.4.2-2: Cell-specific test parameters for E-UTRAN TDD UE Rx-Tx time difference measurement under time-domain measurement resource restriction with non-MBSFN ABS

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Parameter	Unit	Cell 1	Cell 2
PDECCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2 R.6 TDD R.6 TDD DCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) in A.3.2.2.2 (OP.2 TDD) OP.1 TDD OP.1 TDD PBCH_RB dB OP.1 TDD OP.2 TDD PBCH_RB dB OP.2 TDD OP.2 TDD PBCH_RB dB OP.2 TDD OP.2 TDD PBCH_RB dB OP.2 TDD OP.2 TDD PBCH_RB dB OP.2 TDD OP.2 TDD PBCH_RB dB OP.2 TDD OP.2 TDD PBCH_RB dB OB.2 TDD OP.2 TDD PBCH_RB dB OB.2 TDD OP.2 TDD PDCH_RB dB OB.2 TDD OP.2 TDD PDCCH_RB dB OB.2 TDD OP.2 T	PDSCH Reference measurement channel defined in A.3.1.1.2		R.0 TDD	N/A
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PDSCH allocation	n_{PRB}	13—36	N/A
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
PBCH_RB dB PSS_RA dB PSS_RA dB PSS_RA dB PSS_RA dB PSS_RA dB PSS_RA dB PHICH_RB dB PHICH_RB dB PDCCH_RB dB PDCCH_RB dB PDSCH_RB dB PDSCH_RB dB PDCNIG_RBNote1 dB POCNIG_RRNote1 dB POCNIG_RNOTE1 dB POCNIG_RNOTE1 dB POCNIG_RNOTE1 dB POCNIG_RNOTE2 dB PS -98	OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.2 TDD
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	PBCH_RA	dB		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	PBCH_RB	dB		
PCFICH_RB dB PHICH_RA dB PHICH_RB dB PDCCH_RB dB PDCCH_RB dB PDSCH_RB dB POSCH_RB dB POSCH_RB dB POSCH_RB -98 LT STAIL -98 LT S	PSS_RA	dB		
PHICH_RA dB dB PHICH_RA dB dB PHICH_RB dB dB PDCCH_RA dB dB PDCCH_RB dB dB PDSCH_RB dB dB PDSCH_RB dB DCNG_RA^{Note1} DCNG_RB^{Note1} dB DCNG_RB^{Note2} DCNG_RB^{Note2} dB M/15 HZ CRS (\hat{E}_s/N_{oc}) dB -3 1 CRS $(\hat{E}_s/I_{ot})_{meas}$ dB -3 -0.76 CRS $(\hat{E}_s/I_{ot})_{monABS}$ dB -6.54 -0.76 CRS $(\hat{E}_s/I_{ot})_{monABS}$ dB -6.54 -0.76 CRS $(\hat{E}_s/N_{oc})_{monABS}$ dB -6.54 -67.89 $(Io)_{meas}^{Note 4}$ dBm/9 HZ -67.89 -67.89 $(Io)_{monABS}^{Note 4}$ dBm/9 HZ -65.81 -65.81	SSS_RA	dB	1	
PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RB PDSCH_RB PDSCH_RA PDSCH_RA PDSCH_RB PD	PCFICH_RB	dB	1	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PHICH_RA	dB	1	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PHICH_RB	dB	0	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PDCCH_RA	dB		powers defined in Table A.3.4.1.1-1.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PDCCH_RB			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PDSCH_RA	dB		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PDSCH_RB			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	OCNG_RA ^{Note1}	dB	1	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			1	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	N_{oc}^{-} Note2	dBm/15	-98	-98
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\operatorname{CRS} \hat{E}_s / N_{oc}$	dB	-3	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CRS $(\hat{E}_s/I_{ot})_{meas}^{}$ Note 3	dB	-3	-0.76
$ \frac{\text{dBm/15}}{\text{kHz}} -101 $	CRS $(\hat{E}_s/I_{ot})_{nonABS}$ Note 3	dB	-6.54	-0.76
$(IO)_{meas}$ MHz -67.89 -67.89 $(IO)_{nonABS}$ $^{Note 4}$ $dBm/9$ $_{MHz}$ -65.81 -65.81	RSRP Note 4		-101	-97
MHz -65.81 -65.81	$({ m Io})_{meas}^{ m Note~4}$		-67.89	-67.89
	(Io) _{nonABS} Note 4		-65.81	-65.81
Propagation Condition AWGN	Propagation Condition			AWGN

Note 1: OCNG shall be used such that the resources in the active cell are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

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

Note 3: $(\hat{E}_s/I_{ot})_{meas}$ is calculated in CRS REs in the subframes indicated for PCell measurements by measurement resource restriction pattern, whilst $(\hat{E}_s/I_{ot})_{nonABS}$ is calculated in CRS REs in the subframes not indicated for PCell measurements by measurement resource restriction paattern.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. $(Io)_{meas}$ is calculated in CRS symbols in the subframes indicated for PCell measurements by measurement resource restriction pattern, whilst $(Io)_{nonABS}$ is calculated in CRS symbols

Table A.9.7.4.2-3: Sounding Reference Symbol Configuration to be used in TDD UE Rx–Tx time difference test

Field	Value	Comment
UL bandwidth	50 RBs	Same as the DL bandwidth
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc1	
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	TRUE	
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	10	SRS periodicity of 10ms for all Tests.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see claus	se 6.3.2 in TS 36.331.	·

A.9.7.4.3 Test Requirements

The UE Rx-Tx time difference measurement accuracy shall fulfill the requirements in Section 9.1.9.3.

A.9.7.5 E-UTRAN FDD UE Rx–Tx time difference under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.9.7.5.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN FDD UE Rx-Tx time difference measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.9.4 when the UE is provided with a time-domain measurement resource restriction pattern and CRS assistance information, and when non-MBSFN ABS configured in the interfering cells.

A.9.7.5.2 Test parameters

In this test case, there are three synchronous cells, Cell 1, Cell 2 and Cell 3, on the same RF channel. Cell 1 is the PCell on which UE Rx-Tx is measured. Cell 2 and Cell 3 are the interfering cells. A non-MBSFN ABS pattern is configured in each of the Cell 2 and Cell 3 during the entire test.

The tested UE is connected to the PCell and configured to transmit SRS signals periodically. The SRS configuration is provided to the UE before the measurement starts. The UE is configured to report UE Rx–Tx time difference measurement. The test equipment measures the transmit timing of the UE using the transmitted SRS, and measures the receive timing using the downlink CRS. The test equipment then compares the difference of these two timings to the UE Rx-Tx measurement reported by the UE. The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on PCell. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement patterns and the CRS assistance information shall be provided via RRC to the UE before the measurement starts

The general and cell-specific parameters for this test case are defined in Table A.9.7.5.2-1 and Table A.9.7.5.2-2, respectively, and the SRS configuration used is specified in Table A.9.7.5.2-3.

Table A.9.7.5.2-1: General test parameters for FDD UE Rx–Tx time difference measurement under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Para	meter	Unit	Value	Comment	
Serving cell (PC	ell)		Cell 1	The measured cell	
Neighbour cell			Cell 2 and Cell 3	Cell 2 is the first interfering cell to Cell 1, whilst	
				Cell 3 is the second interfering cell to Cell 1.	
ABS transmission			Non-MBSFN ABS	As defined in Table A.3.4.1.1-1	
E-UTRA RF Cha			1	One FDD carrier frequency is used	
Downlink Chann	nel Bandwidth	MHz	10	For all cells in the test	
(BW _{channel})					
CP length			Normal	For all cells in the test	
DRX				OFF	
		μs	Cell 2 offset with respect	Three synchronous cells	
Time offset betw	een cells		to Cell 1: 3		
Time one bott	70011 00110		Cell 3 offset with respect		
			to Cell 1: 2		
			(PCI _{cell1} - PCI _{cell2})mod6	Cell PCIs are selected so that both conditions	
Physical cell ID	PCI		=0	are met	
, , , , , , , ,	-		(PCI _{cell1} - PCI _{cell3})mod6		
			!=0	N. MOOENLADO EDD ADO D " (JE	
			10000000100000001000	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54.	
			0000100000010000001000	The first/leftmost bit corresponds to the Pcell	
			00001000000010000000	subframe #0 of a radio frame satisfying SFN	
ABS pattern				mod x = 0, where x is the size of the bit string	
				(40) divided by 10. No MBSFN subframes are	
				configured in the ABS subframes. Configured in	
				Cell 2 and Cell 3 during the testing.	
Time-domain me	easurement		'100000010000001000	and the same same same same same same same sam	
	resource restriction pattern for		00001000000010000000	Configured for measurements on Cell 1.	
PCell measurem					
	physCellId		see PCI conditions above	The CBS assistance information is provided for	
CRS antennaPortsC ount			1	The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It	
			<u> </u>	includes a single MBSFN-SubframeConfig	
information	mbsfn-			element with subframe allocation one	
IIIIOIIIIalioii	SubframeConfi		oneFrame = '000000'	Frame='000000'.	
	gList				

Table A.9.7.5.2-2: Cell-specific test parameters for FDD UE Rx–Tx time difference measurement under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRAN RF Channel Number		1	1	1
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD	N/A	N/A
PDSCH allocation	n_{PRB}	13—36	N/A	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD	N/A	N/A
OCNG Patterns defined in A.3.2.1.5 (OP.5 FDD) and in A.3.2.1.6 (OP.6 FDD)		OP.5 FDD	OP.6 FDD	OP.6 FDD
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB		Non-ABS and A	BS subframe
PHICH_RB	dB	0	channel powers of	
PDCCH_RA	dB		A.3.4.1	4.1.1-1.
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB	7		
OCNG_RA ^{Note1}	dB			
OCNG_RB ^{Note1}	dB			
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98	-98	-98
${\sf CRS}\hat{E}_s/N_{oc}$	dB	-3	3	1
CRS $(\hat{E}_s/I_{ot})_{meas}$ Note 3	dB	-7.76	1.24	-0.76
CRS $(\hat{E}_s/I_{ot})_{nonABS}^{}$ Note 3	dB	-9.29	-1.41	-4.44
RSRP Note 4	dBm/15 kHz	-101	-95	-97
(Io) _{meas} Note 4	dBm/9 MHz	-67.11	-67.11	-67.11
$({ m Io})_{nonABS}$ Note 4	dBm/9 MHz	-63.45	-63.45	-63.45
Propagation condition			AWGN	

NOTE 1: OCNG shall be used such that the resources in the active cell are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

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

Note 3: $(\hat{E}_s/I_{ot})_{meas}$ is calculated in CRS REs in the subframes indicated for PCell measurements by measurement resource restriction pattern, whilst $(\hat{E}_s/I_{ot})_{nonABS}$ is calculated in CRS REs in the subframes not indicated for PCell measurements by measurement resource restriction paattern.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. $(Io)_{meas}$ is calculated in CRS symbols in the subframes indicated for PCell measurements by measurement resource restriction pattern, whilst $(Io)_{nonABS}$ is calculated in CRS symbols in the subframes not indicated for PCell measurements by measurement resource restriction pattern.

Table A.9.7.5.2-3: Sounding Reference Symbol Configuration to be used in FDD UE Rx–Tx time difference test

Field	Value	Comment
UL bandwidth	50 RBs	Same as the DL bandwidth
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc1	
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
srs-ConfigIndex	0	SRS periodicity of 2ms
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
srsAntennaPort	an1	Number of SRS antenna ports
Note: For further information see clau	se 6.3.2 in TS 36.331.	

A.9.7.5.3 Test Requirements

The UE Rx-Tx time difference measurement accuracy shall fulfill the requirements in Section 9.1.9.4.

A.9.7.6 E-UTRAN TDD UE Rx-Tx Time Difference under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

A.9.7.6.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN TDD UE Rx–Tx time difference measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.9.4 when the UE is provided with a time-domain measurement resource restriction pattern and CRS assistance information, and when non-MBSFN ABS configured in the interfering cells.

A.9.7.6.2 Test Parameters

In this test case, there are three synchronous cells, Cell 1, Cell 2 and Cell 3, on the same RF channel. Cell 1 is the PCell on which UE Rx-Tx is measured. Cell 2 and Cell 3 are the interfering cells. A non-MBSFN ABS pattern is configured in each of the Cell 2 and Cell 3 during the entire test.

The tested UE is connected to the PCell and configured to transmit SRS signals periodically. The SRS configuration is provided to the UE before the measurement starts. The UE is configured to report UE Rx–Tx time difference measurement. The test equipment measures the transmit timing of the UE using the transmitted SRS, and measures the receive timing using the downlink CRS. The test equipment then compares the difference of these two timings to the UE Rx-Tx measurement reported by the UE. The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on PCell. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement patterns and the CRS assistance information shall be provided via RRC to the UE before the measurement starts.

The general and cell-specific parameters for this test case are defined in Table A.9.7.6.2-1 and Table A.9.7.6.2-2, respectively, and the SRS configuration used is specified in Table A.9.7.6.2-3.

Table A.9.7.6.2-1: General test parameters for E-UTRAN TDD UE Rx-Tx time difference measurement under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Cell to be measured
Neighbour cell		Cell 2 and Cell 3	Cell 2 is the first interfering cell to Cell 1, whilst
			Cell 3 is the second interfering cell to Cell 1.
ABS transmission configuration		Non-MBSFN ABS	As defined in Table A.3.4.1.1-1
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Downlink Channel Bandwidth (BW _{channel})	MHz	10	For all cells in the test
CP length		Normal	For all cells in the test
Special subframe configuration		6	For all cells in the test. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe		1	For all cells in the test. For uplink-downlink
configuration			subframe configurations see Table 4.2-2 in [16].
DRX			OFF
Time offset between cells	μs	Cell 2 offset with respect to Cell 1: 3 Cell 3 offset with respect to Cell 1: 2	Three synchronous cells
Physical cell ID PCI		(PCI _{cell1} - PCI _{cell2})mod6 =0 (PCI _{cell1} - PCI _{cell3})mod6 !=0	Cell PCIs are selected so that both conditions are met
ABS pattern		'000000001000000001'	Non-MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in Cell 2 and Cell 3 during the testing.
Time-domain measurement resource restriction pattern for serving cell measurements		'00000000010000000001'	Configured for measurements on Cell 1.
physCellId		see PCI conditions above	
CRS antennaPortsC ount		1	The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig
information mbsfn- SubframeConfi gList		oneFrame = '000000'	element with subframe allocation one Frame='000000'.

Table A.9.7.6.2-2: Cell-specific test parameters for E-UTRAN TDD UE Rx-Tx time difference measurement under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRAN RF Channel Number		1	1	1
PDSCH Reference measurement channel		R.0 TDD	N/A	N/A
defined in A.3.1.1.2		11.0 100	14/73	14// (
PDSCH allocation	n_{PRB}	13—36	N/A	N/A
PDCCH/PCFICH/PHICH Reference		R.6 TDD	N/A	N/A
measurement channel defined in A.3.1.2.2		11.0 122	14// (14// (
OCNG Patterns defined in A.3.2.2.1 (OP.1		OP.1 TDD	OP.2 TDD	OP.2 TDD
TDD) and A.3.2.2.2 (OP.2 TDD)		0111188	01.2.100	01 12 100
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB		Non-ABS and	ABS subframe
PHICH_RB	dB	0		defined in Table
PDCCH_RA	dB		A.3.4.1.1-	
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note1}	dB			
OCNG_RB ^{Note1}	dB			
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98	-98	-98
$\operatorname{CRS} \hat{E}_{s} / N_{oc}$	dB	-3	3	1
CRS $(\hat{E}_s/I_{ot})_{meas}^{ ext{Note 3}}$	dB	-7.76	1.24	-0.76
CRS $(\hat{E}_{s}/I_{ot})_{nonABS}$ Note 3	dB	-9.29	-1.41	-4.44
RSRP Note 4	dBm/15 kHz	-101	-95	-97
$(\mathrm{Io})_{meas}^{Note\;4}$	dBm/9 MHz	-67.11	-67.11	-67.11
(Io) _{nonABS} Note 4	dBm/9 MHz	-63.45	-63.45	-63.45
Propagation Condition			AWGN	•
N + 4 CONO I III I I I I I I				

Note 1: OCNG shall be used such that the resources in the active cell are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

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

Note 3: $(\hat{E}_s/I_{ot})_{meas}$ is calculated in CRS REs in the subframes indicated for PCell measurements by measurement resource restriction pattern, whilst $(\hat{E}_s/I_{ot})_{nonABS}$ is calculated in CRS REs in the subframes not indicated for PCell measurements by measurement resource restriction paattern.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. $(Io)_{meas}$ is calculated in CRS symbols in the subframes indicated for PCell measurements by measurement resource restriction pattern, whilst $(Io)_{nonABS}$ is calculated in CRS symbols

Table A.9.7.6.2-3: Sounding Reference Symbol Configuration to be used in TDD UE Rx–Tx time difference test

Field	Value	Comment
UL bandwidth	50 RBs	Same as the DL bandwidth
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc1	
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	TRUE	
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	10	SRS periodicity of 10ms for all
-		Tests.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used
		for SRS transmission

A.9.7.6.3 Test Requirements

The UE Rx-Tx time difference measurement accuracy shall fulfill the requirements in Section 9.1.9.4.

A.9.8 RSTD

A.9.8.1 E-UTRAN FDD RSTD intra frequency case

A.9.8.1.1 Test Purpose and Environment

The purpose of this test is to verify that the RSTD intra-frequency measurement accuracy is within the specified limits in clause 9.1.10.1 in AWGN channels.

In the test, there are two synchronous cells, Cell 1 as the reference cell and Cell 2 as the neighbour cell on the same frequency.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of measurement period, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

A time span of $T_{RSTD\ IntraFreqFDD,\ E-UTRAN}$ is provided for the measurement period, and PRS are configured according to I_{PRS} in Tables A.9.8.1.1-1 and A.9.8.1.1-2 during this time.

The test parameters are given in Table A.9.8.1.1-1 and Table A.9.8.1.1-2.

Table A.9.8.1.1-1: General Test Parameters for intra frequency RSTD Tests for E-UTRAN FDD

Parameter	Unit	Value			Comment	
		Test1	Test2	Test3	Test4	
PCFICH/PDCCH/PHICH parameters		R.8	FDD	R.6 FDD		As specified in clause A.3.1.2.1
OCNG Patterns defined in A.3.2.1		OP.7 FDD		OP.6 FDD		OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).
Reference cell				II 1		
Neighbour cell				1 2		0 500
E-UTRA RF Channel Number				1		One FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	1	.4	1	0	
PRS Bandwidth	RB	6		50		PRS bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
PRS configuration Index I_{PRS}		1	12 2			As defined in TS 36.211
Number of consecutive positioning downlink subframes $N_{\rm PRS}$		(6	1		As defined in TS 36.211
prs-MutingInfo				1110000' 1110000'		See clause 6.5.1.2 in TS 36.355 for more information
Cell ID		(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 0	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 1	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 0	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 3	
expectedRSTD	us	Cell 2: 1 Other neighbour cells: randomly between -3 and 3	Cell 2: -1 Other neighbour cells: randomly between -3 and 3	Cell 2: -1 Other neighbour cells: randomly between -3 and 3	Cell 2: 1 Other neighbour cells: randomly between -3 and 3	
expectedRSTDUncertainty for all neighbour cells	us	5	5	5	5	
CP length				mal		
DRX				FF		
Radio frame receive time offset between the cells at the UE antenna connector	us	Cell 2 to Cell 2 to Cell 1: 3		Cell 2 to Cell 1: 3	Cell 2 to Cell 1: -3	PRS are transmitted from synchronous cells
Number of cells provided in OTDOA assistance data		16				The number of cells includes the reference cell
T _{RSTD} IntraFreqFDD, E-UTRAN	ms	2560				Derived according to the RSTD measurement requirements specified in Clause 8.1.2.5.1

Table A.9.8.1.1-2: Cell Specific Test Parameters for intra frequency RSTD Tests for E-UTRAN FDD

Parameter	Unit	Те	st1	Test2		Test3		Test4	
Farameter	Onit	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2
E-UTRA RF Channel					1				
Number					ı				
PBCH_RA									
PBCH_RB									
PSS_RA									
SSS_RA									
PCFICH_RB									
PHICH_RA	dB	0	0	0	0	0	0	0	0
PHICH_RB									
PDCCH_RA									
PDCCH_RB									
OCNG_RA ^{Note1}									
OCNG_RB ^{Note1}									
PRS_RA	dB	0	0	-3	0	0	0	-3	0
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98	-98	-98	-98	-98	-98	-98	-98
PRS $\hat{ ext{E}}_{ ext{s}}/N_{oc}$	dB	-2.37	-8.02	-6	-13	-2.37	-8.02	-6	-13
PRS $\hat{E}_{_{s}}/I_{_{ot}}$ Note3	dB	-3	-10	-6	-13	-3	-10	-6	-13
lo ^{Note3}	dBm/1.08 MHz	-78.92	-78.92	-79.21	-79.21	N/A	N/A	N/A	N/A
	dBm/9 MHz	N/A	N/A	N/A	N/A	-69.72	-69.72	-70	-70
PRP Note3	dBm/15kHz	-100.37	-106.02	-104	-111	-100.37	-106.02	-104	-111
${ m \hat{E}}_{ m s}/N_{\it oc}$ Note 3	dB	-2.37	-8.02	-3	-13	-2.37	-8.02	-3	-13
RSRP Note 3	dBm/15kHz	-100.37	-106.02	-101	-111	-100.37	-106.02	-101	-111
Propagation condition	AWGN								
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).									

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

Note 3: \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS

A.9.8.1.2 Test Requirements

The RSTD measurement accuracy shall fulfill the requirements in clause 9.1.10.1.

A.9.8.2 E-UTRAN TDD RSTD intra frequency case

A.9.8.2.1 Test Purpose and Environment

The purpose of this test is to verify that the RSTD intra-frequency measurement accuracy is within the specified limits in clause 9.1.10.1 in AWGN channels.

In the test, there are two synchronous cells, Cell 1 as the reference cell and Cell 2 as the neighbour cell on the same frequency.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of measurement period, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

A time span of $T_{RSTD\ IntraFreqTDD,\ E-UTRAN}$ is provided for the measurement period, and PRS are configured according to I_{PRS} in Tables A.9.8.2.1-1 and A.9.8.2.1-2 during this time.

The test parameters are given in Table A.9.8.2.1-1 and Table A.9.8.2.1-2.

Table A.9.8.2.1-1: General Test Parameters for intra frequency RSTD Tests for E-UTRAN TDD

Parameter	Unit		Va	lue		Comment
		Test1	Test2	Test3	Test4	
PCFICH/PDCCH/PHICH parameters		R.8	TDD	R.6	TDD	As specified in clause A.3.1.2.2
OCNG Patterns defined in A.3.2.2		OP.4 TDD		OP.2 TDD		OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).
Reference cell Neighbour cell		Cell 1 Cell 2				
E-UTRA RF Channel		Oeii 2		1		One TDD carrier
Number Channel Bandwidth	MHz		.4	1	0	frequency is used.
(BW _{channel})	IVITZ	ı	.4	'	0	DDO I I I I I I I
PRS Bandwidth	RB	(6	5	60	PRS bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Special subframe configuration		6		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells.
Uplink-downlink configuration		3		1		As specified in table 4.2-2 in TS 36.211 and table 8.1.2.5.2-2. The same configuration in both cells.
PRS configuration Index $I_{ m PRS}$		(9	14		As defined in TS 36.211
Number of consecutive positioning downlink subframes N_{PRS}		6	6		1	As defined in TS 36.211
prs-MutingInfo		Cell 1: '11110	Cell 2: '1	1110000'		See clause 6.5.1.2 in TS 36.355 for more information
Cell ID		(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 0	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 1	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 0	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 3	
expectedRSTD	us	Cell 2: 1 Other neighbour cells: randomly between -3 and 3	Cell 2: -1 Other neighbour cells: randomly between -3 and 3	Cell 2: -1 Other neighbour cells: randomly between -3 and 3	Cell 2: 1 Other neighbour cells: randomly between -3 and 3	
expectedRSTDUncertainty for all neighbour cells	us	5	5	5	5	
CP length			Noi	rmal		
DRX		OFF	T	1	Γ	
Radio frame receive time offset between the cells at the UE antenna connector	us	Cell 2 to Cell 1: -3	Cell 2 to Cell 1: 3	Cell 2 to Cell 1: 3	Cell 2 to Cell 1: -3	PRS are transmitted from synchronous cells
Number of cells provided in OTDOA assistance data			16			The number of cells includes the reference cell

$T_{RSTD\ IntraFreqTDD,\ E-UTRAN}$	ms	2560	Derived according to the RSTD measurement requirements specified in Clause 8.1.2.5.2
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Table A.9.8.2.1-2: Cell Specific Test Parameters for intra frequency RSTD Tests for E-UTRAN TDD

Doromotor	Unit	Te	st1	Test2		Test3		Test4	
Parameter	Unit	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2
E-UTRA RF Channel					1				
Number									
PBCH_RA									
PBCH_RB									
PSS_RA									
SSS_RA									
PCFICH_RB									
PHICH_RA	dB	0	0	0	0	0	0	0	0
PHICH_RB									
PDCCH_RA									
PDCCH_RB									
OCNG_RA ^{Note1}									
OCNG_RB ^{Note1}									
PRS_RA	dB	0	0	-3	0	0	0	-3	0
$N_{_{oc}}^{ m Note2}$	dBm/15 kHz	-98	-98	-98	-98	-98	-98	-98	-98
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-2.37	-8.02	-6	-13	-2.37	-8.02	-6	-13
PRS $\hat{E}_{_{s}}/I_{_{ot}}^{}$ Note3	dB	-3	-10	-6	-13	-3	-10	-6	-13
lo Note3	dBm/1.08 MHz	-78.92	-78.92	-79.21	-79.21	N/A	N/A	N/A	N/A
	dBm/9 MHz	N/A	N/A	N/A	N/A	-69.72	-69.72	-70	-70
PRP Note3	dBm/15kHz	-100.37	-106.02	-104	-111	-100.37	-106.02	-104	-111
${ m \hat{E}}_{ m s}/N_{oc}$ Note 3	dB	-2.37	-8.02	-3	-13	-2.37	-8.02	-3	-13
RSRP Note 3	dBm/15kHz	-100.37	-106.02	-101	-111	-100.37	-106.02	-101	-111
Propagation condition					AW	GN	•		•

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).

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

Note 3: \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS.

A.9.8.2.2 Test Requirements

The RSTD measurement accuracy shall fulfill the requirements in clause 9.1.10.1.

A.9.8.3 E-UTRAN FDD-FDD RSTD inter frequency case

A.9.8.3.1 Test Purpose and Environment

The purpose of these tests is to verify that the RSTD inter-frequency measurement accuracy is within the specified limits in clause 9.1.10.2 in AWGN channels.

There are two synchronous cells on different carrier frequencies in the test. In all test cases, Cell 1 is the reference cell as well as the PCell and Cell 2 the neighbor cell. The inter frequency measurements on Cell 2 are supported by measurement gaps. PCIs of the two cells are selected randomly.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of measurement period, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data. The measurement gap configuration is known and configured in the UE before the measurements start.

There is no PDSCH allocated in the subframe transmitting PRS. A time span of $T_{RSTD\ InterFreqFDD,\ E-UTRAN}$ is provided for the measurement period, and PRS are configured according to I_{PRS} in Table A.9.8.3.1-1 and Table A.9.8.3.1-2 for each of the two cells during this time.

The test parameters are given in Table A.9.8.3.1-1 and Table A.9.8.3.1-2.

Table A.9.8.3.1-1: General Test Parameters for inter frequency RSTD Tests for E-UTRAN FDD

Parameter	Unit	Value		Comment
		Test1	Test2	
PCFICH/PDCCH/PHICH parameters		R.8 FDD	R.6 FDD	As specified in clause A.3.1.2.1
OCNG Patterns defined in A.3.2.1		OP.7 FDD	OP.6 FDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).
Reference cell		Cell 1		Cell 1 on RF channel number 1
Neighbour cell		Cell 2		Cell 2 on RF channel number 2
E-UTRA RF Channel Number		1,2		Two FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	1.4	10	·
PRS Bandwidth	RB	6	50	PRS bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Number of consecutive positioning downlink subframes N_{PRS}		6	1	As defined in TS 36.211
prs-MutingInfo		Cell1:'1111 Cell2:'1111		See clause 6.5.1.2 in TS 36.355 for more information
expectedRSTD	μs	Cell 2:1 Other neig randomly b and 3	hbour cells: between -3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
expectedRSTDUncertainty for all neighbour cells	μs	5		The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
CP length		Normal		
DRX		OFF		
Radio frame transmit time offset between the cells at the UE antenna connector	μѕ	Cell 2 to Cell 1: 3	Cell 2 to Cell 1: -3	Synchronous cells
Number of cells provided in OTDOA assistance data		16		The list includes the reference cell (received in OTDOA-ReferenceCellInfo [24]) on RF channel 1 and 15 other cells on RF channel 2, all received in OTDOA-ProvideAssistanceData [24].
T _{RSTD InterFreqFDD, E-UTRAN}	ms	5120		Derived according to the RSTD measurement requirements specified in Clause 8.1.2.6.1

Table A.9.8.3.1-2: Cell Specific Test Parameters for inter frequency RSTD Tests for E-UTRAN FDD

Damanatan	11-24	Te	st1	Test2		
Parameter	Unit	Cell1	Cell2	Cell1	Cell2	
E-UTRA RF Channel Number		1	2	1	2	
GapOffset		18	N/A	11	N/A	
Gap Pattern ID		0	N/A	0	N/A	
PRS configuration Index I_{PRS}		12	19	2	12	
PRS subframe offset		N/A	7	N/A	10	
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA	dB	0	0	0	0	
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
OCNG_RA ^{Note1}						
OCNG_RB ^{Note1}						
PRS_RA	dB	-3	0	-3	0	
$N_{oc}^{ m Note2}$	dBm/15 kHz		-(98		
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$	dB	-6	-13	-6	-13	
PRS $\hat{E}_{_{s}}/I_{_{ot}}$ Note3	dB	-6	-13	-6	-13	
lo Note3	dBm/1.08 MHz	-79.25	-79.39	N/A	N/A	
	dBm/9 MHz	N/A	N/A	-70.04	-70.18	
PRP Note3	dBm/15kHz	-104	-111	-104	-111	
${ m \hat{E}}_{ m s}/N_{oc}^{ m Note 3}$	dB	-3	-13	-3	-13	
RSRP Note 3	dBm/15kHz	-101	-111	-101	-111	
Propagation condition		AWGN				

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 3: \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS.

A.9.8.3.2 Test Requirements

The RSTD measurement accuracy shall fulfill the requirements in clause 9.1.10.2.

A.9.8.4 E-UTRAN TDD-TDD RSTD inter frequency case

A.9.8.4.1 Test Purpose and Environment

The purpose of this test is to verify that the RSTD inter-frequency measurement accuracy is within the specified limits in clause 9.1.10.2 in AWGN channels.

There are two synchronous cells on different carrier frequencies in the test. In all test cases, Cell 1 is the reference cell as well as the PCell and Cell 2 is the neighbour cell. The inter frequency measurements on Cell 2 are supported by a measurement gap. PCIs of the two cells are selected randomly.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of measurement period, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data. The measurement gap configuration is known and configured in the UE before the measurements start.

There is no PDSCH allocated in the subframe transmitting PRS. A time span of $T_{RSTD\ InterFreqTDD,\ E-UTRAN}$ is provided for the measurement period, and PRS are configured according to I_{PRS} in Table A.9.8.4.1-1 and Table A.9.8.4.1-2 for each of the two cells during this time.

The test parameters are given in Table A.9.8.4.1-1 and Table A.9.8.4.1-2.

Table A.9.8.4.1-1: General Test Parameters for inter frequency RSTD Tests for E-UTRAN TDD

Parameter	Unit	Value		Comment
		Test1	Test2	
PCFICH/PDCCH/PHICH		R.8 TDD	R.6 TDD	As specified in clause A.3.1.2.2
parameters		K.6 IDD	K.0 IDD	
OCNG Patterns defined in A.3.2.2		OP.4	OP.2	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power
CONOT allems defined in A.S.2.2		TDD	TDD	spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).
Reference cell		Cell 1		Cell 1 on RF channel number 1
Neighbour cell		Cell 2		Cell 2 on RF channel number 2
E-UTRA RF Channel Number		1,2		Two TDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	1.4	10	
PRS Bandwidth	RB	6	50	PRS bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells.
Uplink-downlink configuration		3	1	As specified in table 4.2-2 in TS 36.211 and table 8.1.2.5.2-2.
Number of consecutive positioning downlink subframes N_{PRS}		6	1	As defined in TS 36.211
prs-MutingInfo		Cell1:'111'	10000'	PRS muting is not used. See clause 6.5.1.2 in TS
pro mamiginio		Cell2:'111'		36.355 for more information
expectedRSTD		Cell 2: 1		The expected RSTD is what is expected at the
•	_	Other neig	hbour cells:	receiver. The corresponding parameter in the
	μs	randomly b and 3	etween -3	OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
expectedRSTDUncertainty for all neighbour cells	μs	5	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the
3	μδ			expectedRSTD-Uncertainty index
CP length		Normal		
DRX		OFF		
Radio frame receive time offset between the cells at the UE	μs	Cell 2 to Cell 1: 3	Cell 2 to Cell 1: -3	PRS are transmitted from synchronous cells
antenna connector				
Number of cells provided in OTDOA assistance data		16		The list includes the reference cell (received in OTDOA-ReferenceCellInfo [24]) on RF channel 1 and 15 other cells on RF channel 2, all received in
$T_{ m RSTD~InterFreqTDD}$, E-UTRAN	ms	5120		OTDOA-ProvideAssistanceData [24]. Derived according to the RSTD measurement
KS 1D IMETTEQ IDD, E-UTKAN	_	-		requirements specified in Clause 8.1.2.6.3

Table A.9.8.4.1-2: Cell Specific Test Parameters for inter frequency RSTD Tests for E-UTRAN TDD

Dovementor	l lait	Te	st1	Test2		
Parameter	Unit	Cell1	Cell2	Cell1	Cell2	
E-UTRA RF Channel Number		1	2	1	2	
Gap pattern ID		0	N/A	0	N/A	
Gapoffset		34	N/A	13	N/A	
PRS configuration Index I_{PRS}		15	35	4	14	
PRS subframe offset		N/A	20	N/A	10	
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA	dB		(0		
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
OCNG_RA ^{Note1}						
OCNG_RB ^{Note1}						
PRS_RA	dB	-3	0	-3	0	
$N_{oc}^{ m Note2}$	dBm/15 kHz		-9	98		
PRS $\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$	dB	-6	-13	-6	-13	
PRS $\hat{E}_{s}/I_{ot}^{Note3}$	dB	-6	-13	-6	-13	
lo Note3	dBm/1.08 MHz	-79.25	-79.39	N/A	N/A	
	dBm/9 MHz	N/A	N/A	-70.04	-70.18	
PRP Note3	dBm/15kHz	-104	-111	-104	-111	
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$ Note 3	dB	-3	-13	-3	-13	
RSRP Note 3	dBm/15kHz	-101	-111	-101	-111	
Propagation condition		AWGN				

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
- Note 3: \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , Io, RSRP and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS.

A.9.8.4.2 Test Requirements

The RSTD measurement accuracy shall fulfill the requirements in clause 9.1.10.2.

A.9.8.5 E-UTRAN FDD RSTD Measurement Accuracy in Carrier Aggregation

A.9.8.5.1 Test Purpose and Environment

The purpose of these tests is to verify that the E-UTRAN FDD RSTD measurement accuracy in carrier aggregation is within the specified limits in clause 9.1.12.

There are three synchronous cells on two different carrier frequencies in the test. Cell 1 is the PCell on primary component carrier F1 (RF channel number 1), Cell 2 is the SCell and reference cell on sceondary component carrier F2 (RF channel number 2), and Cell 3 is the neighbor cell on F2.

Cell2 and Cell3 are included in the OTDOA assistance data, whilst Cell1 is not included in the OTDOA assistance data. The RSTD measurements are performed between Cell 2 and Cell 3 to verify that when both the reference cell and

neighbouring cell belong to the secondary component carrier the RSTD measurement accuracy can meet the intrafrequency RSTD accuracy requirements defined in clause 9.1.10.1.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of measurement period, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data. The measurement gap is not configured in the test because of UE carrier aggregation capability.

There is no PDSCH allocated in the subframe transmitting PRS. A time span of $T_{RSTD\ IntraFreqFDD,\ E-UTRAN}$ is provided for the measurement period, and PRS are configured according to I_{PRS} in Table A.9.8.5.1-1 and Table A.9.8.5.1-2 for each of the three cells during this time.

The test parameters are given in Table A.9.8.5.1-1 and Table A.9.8.5.1-2.

Table A.9.8.5.1-1: General Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation

Parameter	Unit	Value	Comment
PCFICH/PDCCH/PHICH		R.6 FDD	As specified in clause A.3.1.2.1
parameters		K.0 FDD	
OCNG Patterns defined in A.3.2.1		OP.6 FDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Assistance data reference cell		Cell 2	Cell 2 is the SCell on RF channel number 2
PCell		Cell 1	Cell 1 on RF channel number 1
Neighbour cell		Cell 3	Cell 3 on RF channel number 2
E-UTRA RF Channel Number		1,2	Two FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	·
PRS Bandwidth	RB	50	PRS Bandwidth bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Number of consecutive positioning downlink subframes N_{PRS}		1	As defined in TS 36.211
prs-MutingInfo		Cell1:'11110000' Cell2:'11110000' Cell3:'11110000'	See clause 6.5.1.2 in TS 36.355 for more information
Cell ID		(Cell ID of cell 2 – Cell ID of cell 3) mod 6 = 3	PCI of cell 1 is selected randomly.
expectedRSTD	μs	Cell 3:-2 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
expectedRSTDUncertainty for all neighbour cells	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
CP length		Normal	
DRX		OFF	
Radio frame receive time offset between the cells at the UE antenna connector	μs	Cell 1 to Cell 2: -1 Cell 3 to Cell 2:1	PRS are transmitted from synchronous cells
Time alignment error between cell2 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Number of cells provided in OTDOA assistance data		16	The list includes the assistance-data- reference cell (received in OTDOA- ReferenceCellInfo [24]) and 15 other cells, all received in OTDOA- ProvideAssistanceData [24]. All cells provided in OTDOA assistance data are on RF channel 2.
$T_{ m RSTD~IntraFreqFDD,~E-UTRAN}$	ms	2560	Derived according to the RSTD measurement requirements specified in Clause 8.1.2.5.1

Table A.9.8.5.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation

Parameter	Unit	Cell1	Cell2	Cell3
E-UTRA RF Channel Number		1	2	2
PRS configuration Index I_{PRS}		2	2	2
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA	dB	0	0	0
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA ^{Note1}				
OCNG_RB ^{Note1}				
PRS_RA	dB	-3	0	0
$N_{oc}^{ m Note2}$	dBm/15 kHz		-98	
PRS \hat{E}_s/N_{oc}	dB	-6	-6	-13
PRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	-6	-6	-13
lo ^{Note3}	dBm/9 MHz	-70.04	-70.01	-70.01
PRP Note3	dBm/15kHz	-104	-104	-111
RSRP Note3	dBm/15kHz	-101	-104	-111
\hat{E}_s/N_{oc} Note3	dB	-3	-6	-13
Propagation condition			AWGN	•

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).

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

Note 3: \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , RSRP, lo and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. lo values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS.

A.9.8.5.2 Test Requirements

The measurement accuracy of RSTD between Cell2 and Cell3 shall fulfill the requirements in clause 9.1.12.

A.9.8.6 E-UTRAN TDD RSTD Measurement Accuracy in Carrier Aggregation

A.9.8.6.1 Test Purpose and Environment

The purpose of these tests is to verify that the E-UTRAN TDD RSTD measurement accuracy in carrier aggregation is within the specified limits in clause 9.1.12.

There are three synchronous cells on two different carrier frequencies in the test. Cell 1 is the PCell on primary component carrier F1 (RF channel number 1), Cell 2 is the SCell and reference cell on sceondary component carrier F2 (RF channel number 2), and Cell 3 is the neighbor cell on F2.

Cell2 and Cell3 are included in the OTDOA assistance data, whilst Cell1 is not included in the OTDOA assistance data. The RSTD measurements are performed between Cell 2 and Cell 3 to verify that when both the reference cell and neighbouring cell belong to the secondary component carrier the RSTD measurement accuracy can meet the intrafrequency RSTD accuracy requirements defined in clause 9.1.10.1.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of measurement period, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data. The measurement gap is not configured in the test because of UE carrier aggregation capability.

There is no PDSCH allocated in the subframe transmitting PRS. A time span of $T_{RSTD\ IntraFreqTDD,\ E-UTRAN}$ is provided for the measurement period, and PRS are configured according to I_{PRS} in Table A.9.8.6.1-1 and Table A.9.8.6.1-2 for each of the three cells during this time.

The test parameters are given in Table A.9.8.6.1-1 and Table A.9.8.6.1-2.

Table A.9.8.6.1-1: General Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation

Parameter	Unit	Value	Comment
PCFICH/PDCCH/PHICH			As specified in clause A.3.1.2.2
parameters		R.6 TDD	•
OCNG Patterns defined in A.3.2.2		OP.2 TDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Assistance data reference cell		Cell 2	Cell 2 is the SCell on RF channel number 2
PCell		Cell 1	Cell 1 on RF channel number 1
Neighbour cell		Cell 3	Cell 3 on RF channel number 2
E-UTRA RF Channel Number		1,2	Two TDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
PRS Bandwidth	RB	50	PRS Bandwidth bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Number of consecutive positioning downlink subframes N_{PRS}		1	As defined in TS 36.211
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells.
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 and table 8.1.2.5.2-2. The same configuration in both cells.
prs-MutingInfo		Cell1:'11110000' Cell2:'11110000' Cell3:'11110000'	See clause 6.5.1.2 in TS 36.355 for more information
Cell ID		(Cell ID of cell 2 – Cell ID of cell 3) mod 6 = 3	PCI of cell 1 is selected randomly.
expectedRSTD	μs	Cell 3:-2 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
expectedRSTDUncertainty for all neighbour cells	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
CP length DRX		Normal OFF	
Radio frame receive time offset between the cells at the UE antenna connector	μs	Cell 1 to Cell 2: -1 Cell 3 to Cell 2:1	PRS are transmitted from synchronous cells
Time alignment error between cell2 and cell1	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Number of cells provided in OTDOA assistance data		16	The list includes the assistance-data- reference cell (received in OTDOA- ReferenceCellInfo [24]) and 15 other cells, all received in OTDOA- ProvideAssistanceData [24]. All cells provided in OTDOA assistance data are on RF channel 2.
T _{RSTD IntraFreqTDD} , E-UTRAN	ms	2560	Derived according to the RSTD measurement requirements specified in Clause 8.1.2.5.2

Table A.9.8.6.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation

Parameter	Unit	Cell1	Cell2	Cell3
E-UTRA RF Channel Number		1	2	2
PRS configuration Index I_{PRS}		14	14	14
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA	dB	0	0	0
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA ^{Note1}				
OCNG_RB ^{Note1}				
PRS_RA	dB	-3	0	0
$N_{oc}^{$	dBm/15 kHz		-98	
PRS \hat{E}_s/N_{oc}	dB	-6	-6	-13
PRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	-6	-6	-13
Io Note3	dBm/9 MHz	-70.04	-70.01	-70.01
PRP Note3	dBm/15kHz	-104	-104	-111
RSRP Note3	dBm/15kHz	-101	-104	-111
$\hat{E}_{\scriptscriptstyle S}/N_{\scriptscriptstyle oc}$ Note3	dB	-3	-6	-13
Propagation condition			AWGN	•

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).

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

Note 3: \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , RSRP, lo and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS.

A.9.8.6.2 Test Requirements

The measurement accuracy of RSTD between Cell2 and Cell3 shall fulfill the requirements in clause 9.1.12.

A.9.8.7 E-UTRAN FDD RSTD Measurement Accuracy in Carrier Aggregation for 20MHz bandwidth

A.9.8.7.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.8.5.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.8.7.1-1 and A.9.8.7.1-2 will replace the values of corresponding parameters in Tables A.9.8.5.1-1 and A.9.8.5.1-2.

Table A.9.8.7.1-1: General Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation for 20MHz bandwidth

Parameter	Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters		R.10 FDD	As specified in clause A.3.1.2.1
OCNG Patterns defined in A.3.2.1.14		OP.14 FDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Channel Bandwidth (BW _{channel})	MHz	20	
PRS Bandwidth	RB	100	PRS Bandwidth bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Note 1: See Table A.9.8.5.1-1 Note 2: N/A	for other g	eneral test parameters.	T accidiance data defined in [2 i].

Table A.9.8.7.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation for 20MHz bandwidth

		Unit	Cell1	Cell2	Cell3	
lo Note1		dBm/18 MHz	-67.03	-67.00	-67.00	
Note 1: Io level has been derived from other parameters for information purposes. It is not settable parameter itself. Io values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS						
Note 2:	See Table A.9.8.5.	1-2 for other cell specific test par	ameters.			

A.9.8.7.2 Test Requirements

The test requirements defined in section A.9.8.5.2 shall apply to this test case.

A.9.8.8 E-UTRAN TDD RSTD Measurement Accuracy in Carrier Aggregation for 20MHz bandwidth

A.9.8.8.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.8.6.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.8.8.1-1 and A.9.8.8.1-2 will replace the values of corresponding parameters in Tables A.9.8.6.1-1 and A.9.8.6.1-2.

Table A.9.8.8.1-1: General Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation for 20MHz bandwidth

Parameter	Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters		R.10 TDD	As specified in clause A.3.1.2.2
OCNG Patterns defined in A.3.2.2.8		OP.8 TDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Channel Bandwidth (BW _{channel})	MHz	20	
PRS Bandwidth	RB	100	PRS Bandwidth bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Note 1: See Table A.9.8.6.1-1 Note 2: N/A	for othe	er general test parameters.	

Table A.9.8.8.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation for 20MHz bandwidth

Parameter Unit		Cell1	Cell2	Cell3		
lo Note1		dBm/18 MHz	-67.03	-67.00	-67.00	
Note 1:	values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS					

A.9.8.8.2 Test Requirements

The test requirements defined in section A.9.8.6.2 shall apply to this test case.

A.9.8.9 E-UTRAN FDD RSTD Measurement Accuracy in Carrier Aggregation for 10MHz+5MHz

A.9.8.9.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.8.5.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.8.9.1-1 and A.9.8.9.1-2 will replace the values of corresponding parameters in Tables A.9.8.5.1-1 and A.9.8.5.1-2.

Table A.9.8.9.1-1: General Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation for 10MHz+5MHz

Parameter	Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters		Cell1: R.6 FDD Cell2: R.11 FDD Cell3: R.11 FDD	As specified in clause A.3.1.2.1
OCNG Patterns defined in A.3.2.1		Cell1: OP.6 FDD Cell2: OP.19 FDD Cell3: OP.19 FDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Channel Bandwidth (BW _{channel})	MHz	Cell1: 10 Cell2: 5 Cell3: 5	
PRS Bandwidth	RB	Cell1: 50 Cell2: 25 Cell3: 25	PRS Bandwidth bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Number of consecutive positioning downlink subframes N_{PRS}		2	As defined in TS 36.211
Note 1: See Table A.9.8.5	5.1-1 for	other general test para	ameters.

Note 2: N/A

Table A.9.8.9.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation for 10MHz+5MHz

Parameter	Unit	Cell1	Cell2	Cell3			
lo Note1	dBm/9 MHz	-70.04	N/A	N/A			
10	dBm/4.5 MHz	N/A	-73.02	-73.02			
Note 1: Id	Note 1: lo level has been derived from other parameters for information purposes. It						
is	is not settable parameter itself. Io values are derived in the case that there is						
no PBCH, PSS or SSS in the OFDM symbols carrying PRS							
Note 2: S	See Table A.9.8.5.1-2 for other	er cell specific te	st parameters.				

A.9.8.9.2 Test Requirements

The test requirements defined in section A.9.8.5.2 shall apply to this test case.

A.9.8.10 E-UTRAN TDD RSTD Measurement Accuracy in Carrier Aggregation for 10MHz+5MHz

A.9.8.10.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.8.6.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.8.10.1-1 and A.9.8.10.1-2 will replace the values of corresponding parameters in Tables A.9.8.6.1-1 and A.9.8.6.1-2.

Table A.9.8.10.1-1: General Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation for 10MHz+5MHz

Parameter	Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters		Cell1: R.6 TDD Cell2: R.11 TDD Cell3: R.11 TDD	As specified in clause A.3.1.2.2
OCNG Patterns defined in A.3.2.2		Cell1: OP.2 TDD Cell2: OP.10 TDD Cell3: OP.10 TDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Channel Bandwidth (BW _{channel})	MHz	Cell1: 10 Cell2: 5 Cell3: 5	
PRS Bandwidth	RB	Cell1: 50 Cell2: 25 Cell3: 25	PRS Bandwidth bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Number of consecutive positioning downlink subframes N_{PRS}		2	As defined in TS 36.211
Note 1: See Table A.9.8.6	3.1-1 for c	other general test parar	meters.

Note 2:

Table A.9.8.10.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation for 10MHz+5MHz

Parameter		Unit	Cell1	Cell2	Cell3	
Io Note1		dBm/9 MHz	-70.04	N/A	N/A	
10	dBm/4.5 MHz		N/A	-73.02	-73.02	
Note 1: lo level has been derived from other parameters for information purposes. It is not settable parameter itself. lo values are derived in the case that there is no PBCH,						
PSS or SSS in the OFDM symbols carrying PRS						
Note 2: S	ee	Table A.9.8.6.1-2 for oth	er cell specific test	parameters.		

A.9.8.10.2 **Test Requirements**

The test requirements defined in section A.9.8.6.2 shall apply to this test case.

A.9.8.11 E-UTRAN FDD RSTD Measurement Accuracy in Carrier Aggregation for 5 + 5MHz bandwidth

A.9.8.11.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.8.5.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.8.11.1-1 and A.9.8.11.1-2 will replace the values of corresponding parameters in Tables A.9.8.5.1-1 and A.9.8.5.1-2.

Table A.9.8.11.1-1: General Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation for 5+5MHz bandwidth

Parameter	Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters		R.11 FDD	As specified in clause A.3.1.2.1
OCNG Patterns defined in A.3.2.1.19		OP.19 FDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Channel Bandwidth (BW _{channel})	MHz	5	
PRS Bandwidth	RB	25	PRS Bandwidth bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Number of consecutive positioning downlink subframes N_{PRS}		2	As defined in TS 36.211
Note 1: See Table A.9.8.5.1-1 for other Note 2: N/A	general t	est parameters.	•

Table A.9.8.11.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation for 5+5MHz bandwidth

Parameter		Unit	Cell1	Cell2	Cell3		
lo Note1		dBm/4.5 MHz	-73.05	-73.02	-73.02		
Note 1: lo level has been derived from other parameters for information purposes. It is not settable parameter itself. Io values are derived in the case that there is no PBCH, PSS or SSS in the							
	OFDM symbols carrying PRS						
Note 2:	See Table A.9	.8.5.1-2 for other cell specific	: test parameters.				

A.9.8.11.2 Test Requirements

The test requirements defined in section A.9.8.5.2 shall apply to this test case.

A.9.8.12 E-UTRAN TDD RSTD Measurement Accuracy in Carrier Aggregation for 5+5MHz bandwidth

A.9.8.12.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.8.6.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.8.12.1-1 and A.9.8.12.1-2 will replace the values of corresponding parameters in Tables A.9.8.6.1-1 and A.9.8.6.1-2.

Table A.9.8.12.1-1: General Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation for 5+5MHz bandwidth

Parameter	Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters		R.11 TDD	As specified in clause A.3.1.2.2
OCNG Patterns defined in A.3.2.2.10		OP.10 TDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Channel Bandwidth (BW _{channel})	MHz	5	
PRS Bandwidth	RB	25	PRS Bandwidth bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
Number of consecutive positioning downlink subframes N_{PRS}		2	As defined in TS 36.211
Note 1: See Table A.9.8.6.1-1 for other gen Note 2: N/A	eral test p	parameters.	

Table A.9.8.12.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation for 5+5MHz bandwidth

Parameter	Unit	Cell1	Cell2	Cell3		
lo Note1	dBm/4.5 MHz	-73.05	-73.02	-73.02		
Note 1: lo level has been derived from other parameters for information purposes. It is not settable parameter itself. lo						

values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS

Note 2: See Table A.9.8.6.1-2 for other cell specific test parameters.

A.9.8.12.2 Test Requirements

The test requirements defined in section A.9.8.6.2 shall apply to this test case.

A.9.8.13 E-UTRAN TDD RSTD Measurement Accuracy in Carrier Aggregation for 20MHz+10MHz

A.9.8.13.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in subclause A.9.8.6.1. The test parameters are the same except those described in the following section. The listed parameter values in Tables A.9.8.13.1-1 and A.9.8.13.1-2 will replace the values of corresponding parameters in Tables A.9.8.6.1-1 and A.9.8.6.1-2.

Table A.9.8.13.1-1: General Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation for 20MHz+10MHz

Parameter	Unit	Value	Comment	
PCFICH/PDCCH/PHICH parameters		Cell1: R.10 TDD Cell2: R.6 TDD Cell3: R.6 TDD	As specified in clause A.3.1.2.2	
OCNG Patterns defined in A.3.2.2		Cell1: OP.8 TDD Cell2: OP.2 TDD Cell3: OP.2 TDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.	
Channel Bandwidth (BW _{channel})	MHz	Cell1: 20 Cell2: 10 Cell3: 10		
PRS Bandwidth	RB	Cell1: 100 Cell2: 50 Cell3: 50	PRS Bandwidth bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].	
Note 1: See Table A.9.8.6.1-1 for other general test parameters. Note 2: N/A				

Table A.9.8.13.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation for 20MHz+10MHz

Paramet	er	Unit	Cell1	Cell2	Cell3
lo ^{Note1}		dBm/ 18MHz	-67.03	N/A	N/A
		dBm/ 9MHz	N/A	-70.01	-70.01
Note 1: lo level has been derived from other parameters for information purposes. It is not settable parameter itself. Io values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS					
Note 2:	See Table A.9.8.6.1-2 for other cell specific test parameters.				

A.9.8.13.2 Test Requirements

The test requirements defined in section A.9.8.6.2 shall apply to this test case.

A.9.8.14 E-UTRAN FDD RSTD Measurement Accuracy in 3DL Carrier Aggregation

A.9.8.14.1 Test Purpose and Environment

The purpose of these tests is to verify that the E-UTRAN FDD RSTD measurement accuracy in carrier aggregation is within the specified limits in clause 9.1.12.

There are four synchronous cells on three different carrier frequencies in the test. Cell 1 is the PCell on primary component carrier F1 (RF channel number 1), Cell 2 is an SCell on secondary component carrier F2 (RF channel number 2), Cell 3 is an SCell and reference cell on secondary component carrier F3 (RF channel number 3), and Cell 4 is the neighbor cell on F3.

Cell 1, Cell2, Cell3, and Cell 4 are included in the OTDOA assistance data. The RSTD measurements are performed

- between Cell 4 and Cell 3 to verify the accuracy of RSTD measurement when the reference cell and neighbouring cell belong to the same secondary component carrier can meet the intra-frequency RSTD accuracy requirements defined in clause 9.1.10.1.
- between Cell 1 and Cell 3 to verify the accuracy of RSTD measurement between the PCell and an SCell can meet the inter-frequency RSTD accuracy requirements defined in clause 9.1.10.2.

- between Cell 2 and Cell 3 to verify the accuracy of RSTD measurement between two SCells can meet the interfrequency RSTD accuracy requirements defined in clause 9.1.10.2.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of measurement period, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data. The measurement gap is not configured in the test because of UE carrier aggregation capability.

There is no PDSCH allocated in the subframe transmitting PRS. A time span of $T_{RSTD\ InterFreqFDD,E-UTRAN}$ is provided for the measurement period, and PRS are configured according to I_{PRS} in Table A.9.8.14.1-1 and Table A.9.8.14.1-2 for each of the three cells during this time.

The test parameters are given in Table A.9.8.14.1-1 and Table A.9.8.14.1-2.

Table A.9.8.14.1-1: General Test Parameters for RSTD Tests for E-UTRAN FDD for 3DL Carrier Aggregation

Parameter	Unit	Value	Comment
PCell		Cell 1	Cell 1 on RF channel number 1
SCell 1		Cell 2	Cell 2 is an SCell on RF channel number 2
SCell 2 (Assistance data reference cell)		Cell 3	Cell 3 is an SCell on RF channel number 3
Neighbour cell		Cell 4	Cell 4 on RF channel number 3
PRS configuration index I_{PRS}		171 for all cells on PCC 181 for all cells on SCC1 191 for all cells on SCC2	This corresponds to periodicity of 320 ms and PRS subframe offset of $I_{\rm PRS}-160 \\ {\rm DL} \ {\rm subframes}, \\ {\rm as \ defined \ in \ TS \ 36.211 \ [16],} \\ {\rm Table \ 6.10.4.3-1}$
prs-MutingInfo		Cell1:'11110000' Cell2:'11110000' Cell3:'11110000' Cell4:'11110000'	See clause 6.5.1.2 in TS 36.355 for more information
prs-SubframeOffset		Cells on PCC: 300 Cells on SCC1: 310 Cells on SCC2, except reference cell: 0	Subframe offset, counted in full subframes. The corresponding parameter in the OTDOA assistance data is prs-SubframeOffset specified in TS 36.355 [24]
slotNumberOffset		Cells on PCC: 0 Cells on SCC1: 0 Cells on SCC2, except reference cell: 0	The slot number offset at the transmitter between a neighbour cell and the assistance data reference cell. The corresponding parameter in the OTDOA assistance data is slotNumberOffset specified in TS 36.355 [24].
Cell ID		(Cell ID of cell 4 – Cell ID of cell 3) mod 6 = 3	PCIs of cell 1 and cell 2 are selected randomly.
expectedRSTD	μs	Cell 1: -2 Cell 2: 0 Cell 4: 2 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
expectedRSTDUncertainty for all neighbour cells	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
CP length		Normal OFF	
Radio frame receive time offset between the cells at the UE antenna connector	μs	Cell 1 to Cell 2: 1 Cell 3 to Cell 2: -1 Cell 4 to Cell 2: 3	PRS are transmitted from synchronous cells
Time alignment errors between Cell 1, Cell 2, and Cell 3	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.

Number of cells provided in OTDOA assistance data		16	The list includes the assistance-data-reference cell (received in OTDOA-ReferenceCellInfo [24]) and 15 other cells, all received in OTDOA-ProvideAssistanceData [24]. Cell 1 and Cell 2 appears at random places in the first half of the neighbour cell list in the OTDOA assistance data. Cell 4 always appears at random places in the second half of the list.
$T_{ m RSTD~InterFreqFDD,E-UTRAN}$	ms	4960	Derived according to the RSTD measurement requirements specified in Clause 8.1.2.6.1

Table A.9.8.14.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation

Parameter	Unit	Cell1	Cell2	Cell3	Cell 4
E-UTRA RF Channel Number		1	2	3	3
Channel Bandwidth (BW _{channel})	MHz	5,10,20	5,10,20	5,10,20	5,10,20
PCFICH/PDCCH/PHICH parameters as		5MHz:	5MHz: R.11	5MHz: R.11	5MHz: R.11
specified in clause A.3.1.2.1		R.11 FDD	FDD	FDD	FDD
		10MHz:	10MHz: R.6	10MHz: R.6	10MHz: R.6
		R.6 FDD	FDD	FDD	FDD
		20MHz:	20MHz:	20MHz:	20MHz:
		R.10 FDD	R.10 FDD 5MHz:	R.10 FDD 5MHz:	R.10 FDD 5MHz:
		5MHz: OP.18 FDD	OP.18 FDD	OP.18 FDD	OP.18 FDD
		10MHz:	10MHz:	10MHz:	10MHz:
OCNG Patterns defined in A.3.2.1		OP.5 FDD	OP.5 FDD	OP.5 FDD	OP.5 FDD
		20MHz:	20MHz:	20MHz:	20MHz:
		OP.13 FDD	OP.13 FDD	OP.13 FDD	OP.13 FDD
PRS Transmission Bandwidth (PRS				5MHz: 25	
transmission bandwidth depends on selected	RB	5MHz: 25 10MHz: 50	5MHz: 25 10MHz: 50	10MHz: 25	5MHz: 25 10MHz: 50
channel bandwidth. PRS are transmitted over	KD	20MHz:100	20MHz:100	20MHz:100	20MHz:100
the system bandwidth)		201VII 12. 100	201011 12. 100	201011 12. 100	201VII 12. 100
Number of consecutive downlink positioning					
subframes N_{PRS} . N_{PRS} also depends on		5MHz: 2	5MHz: 2	5MHz: 2	5MHz: 2
selected channel bandwidth. As defined in TS		10MHz: 1	10MHz: 1	10MHz: 1	10MHz: 1
36.211 [16]. The number of subframes in a		20MHz:1	20MHz:1	20MHz:1	20MHz:1
positioning occasion					
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB	15				•
PHICH_RA	dB	0	0	0	0
PHICH_RB PDCCH_RA					
PDCCH_RB					
OCNG_RA ^{Note1}					
OCNG_RB ^{Note1}					
PRS_RA	dB	-3	0	0	0
_	dBm/15	<u> </u>	_		0
$N_{oc}^{ m Note2}$	kHz	-98			
PRS \hat{E}_s/N_{oc}	dB	-6	-6	-6	-13
PRS $\hat{E}_{\scriptscriptstyle \mathrm{s}}/\mathrm{I}_{\scriptscriptstyle \mathrm{ot}}$	dB	-6	-6	-6	-13
	4D: /0	-70.04	-70.01	-70.01	-70.01
lo ^{Note3}	dBm/9	+10log	+10log	+10log	+10log
	MHz	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)
PRP Note3	dBm/15kHz	-104	-104	-104	-111
RSRP Note3	dBm/15kHz	-101	-104	-104	-111
\hat{E}_s/N_{oc} Note3	dB	-3	-6	-6	-13
Propagation condition			AW	/GN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).

Note 3: \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , RSRP, lo and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. lo values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS.

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

A.9.8.14.2 Test Requirements

The measurement accuracy of RSTD between Cell1 and Cell3 shall fulfill the requirements in clause 9.1.12.2

The measurement accuracy of RSTD between Cell2 and Cell3 shall fulfill the requirements in clause 9.1.12.2

The measurement accuracy of RSTD between Cell4 and Cell3 shall fulfill the requirements in clause 9.1.12.1.

A.9.8.15 E-UTRAN TDD RSTD Measurement Accuracy in 3DL Carrier Aggregation

A.9.8.15.1 Test Purpose and Environment

The purpose of these tests is to verify that the E-UTRAN TDD RSTD measurement accuracy in carrier aggregation is within the specified limits in clause 9.1.12.

There are four synchronous cells on three different carrier frequencies in the test. Cell 1 is the PCell on primary component carrier F1 (RF channel number 1), Cell 2 is an SCell on secondary component carrier F2 (RF channel number 2), Cell 3 is an SCell and reference cell on secondary component carrier F3 (RF channel number 3), and Cell 4 is the neighbor cell on F3.

Cell 1, Cell2, Cell3, and Cell 4 are included in the OTDOA assistance data. The RSTD measurements are performed

- between Cell 4 and Cell 3 to verify the accuracy of RSTD measurement when the reference cell and neighbouring cell belong to the same secondary component carrier can meet the intra-frequency RSTD accuracy requirements defined in clause 9.1.10.1.
- between Cell 1 and Cell 3 to verify the accuracy of RSTD measurement between the PCell and an SCell can meet the inter-frequency RSTD accuracy requirements defined in clause 9.1.10.2.
- between Cell 2 and Cell 3 to verify the accuracy of RSTD measurement between two SCells can meet the interfrequency RSTD accuracy requirements defined in clause 9.1.10.2.

The OTDOA assistance data as defined in TS 36.355, Clause 6.5.1.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of measurement period, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data. The measurement gap is not configured in the test because of UE carrier aggregation capability.

There is no PDSCH allocated in the subframe transmitting PRS. A time span of $T_{RSTD\ InterFreqTDD,\ E-UTRAN}$ is provided for the measurement period, and PRS are configured according to I_{PRS} in Table A.9.8.15.1-1 and Table A.9.8.15.1-2 for each of the three cells during this time.

The test parameters are given in Table A.9.8.15.1-1 and Table A.9.8.15.1-2.

Table A.9.8.15.1-1: General Test Parameters for RSTD Tests for E-UTRAN TDD for 3DL Carrier Aggregation

Parameter	Unit	Value	Comment
PCell		Cell 1	Cell 1 on RF channel number 1
SCell 1		Cell 2	Cell 2 is an SCell on RF channel number 2
SCell 2 (Assistance data reference cell)		Cell 3	Cell 3 is an SCell on RF channel number 3
Neighbour cell		Cell 4	Cell 4 on RF channel number 3
E-UTRA RF Channel Number		1,2,3	Three TDD carrier frequencies are used.
PRS configuration index I_{PRS}		171 for all cells on PCC 181 for all cells on SCC1 191 for all cells on SCC2	This corresponds to periodicity of 320 ms and PRS subframe offset of $I_{\rm PRS}-160$ DL subframes, as defined in TS 36.211 [16], Table 6.10.4.3-1
prs-MutingInfo		Cell1:'11110000' Cell2:'11110000' Cell3:'11110000' Cell4:'11110000'	See clause 6.5.1.2 in TS 36.355 for more information
prs-SubframeOffset		Cells on PCC: 300 Cells on SCC1: 310 Cells on SCC2, except reference cell: 0	Subframe offset, counted in full subframes. The corresponding parameter in the OTDOA assistance data is prs-SubframeOffset specified in TS 36.355 [24]
slotNumberOffset		Cells on PCC: 0 Cells on SCC1: 0 Cells on SCC2, except reference cell: 0	The slot number offset at the transmitter between a neighbour cell and the assistance data reference cell. The corresponding parameter in the OTDOA assistance data is slotNumberOffset specified in TS 36.355 [24].
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells.
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 and table 8.1.2.5.2-2. The same configuration in both cells.
Cell ID		(Cell ID of cell 4 – Cell ID of cell 3) mod 6 = 3	PCIs of cell 1 and cell 2 are selected randomly.
expectedRSTD	μs	Cell 1: -2 Cell 2: 0 Cell 4: 2 Other neighbour cells: randomly between -3 and 3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
expectedRSTDUncertainty for all neighbour cells	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
CP length		Normal	
Radio frame receive time offset between the cells at the UE antenna connector	μѕ	OFF Cell 1 to Cell 2: 1 Cell 3 to Cell 2: -1 Cell 4 to Cell 2: 3	PRS are transmitted from synchronous cells
Time alignment errors between Cell 1, Cell 2, and Cell 3	μs	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.

Number of cells provided in OTDOA assistance data		16	The list includes the assistance-data-reference cell (received in OTDOA-ReferenceCellInfo [24]) and 15 other cells, all received in OTDOA-ProvideAssistanceData [24]. Cell 1 and Cell 2 appears at random places in the first half of the neighbour cell list in the OTDOA assistance data. Cell 4 always appears at random places in the second half of the list.
$T_{ m RSTD~InterFreqTDD,E-UTRAN}$	ms	4960	Derived according to the RSTD measurement requirements specified in Clause 8.1.2.6.3

Table A.9.8.15.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN TDD for Carrier Aggregation

Parameter	Unit	Cell1	Cell2	Cell3	Cell 4
E-UTRA RF Channel Number		1	2	3	3
Channel Bandwidth (BW _{channel})	MHz	5,10,20	5,10,20	5,10,20	5,10,20
PCFICH/PDCCH/PHICH parameters as		5MHz: R11	5MHz: R11	5MHz: R11	5MHz: R11
specified in clause A.3.1.2.2		TDD	TDD	TDD	TDD
		10MHz: R6	10MHz: R6	10MHz: R6	10MHz: R6
		TDD	TDD	TDD	TDD
		20MHz:	20MHz:	20MHz:	20MHz:
		R10 TDD	R10 TDD	R10 TDD	R10 TDD
		5MHz: OP.10 TDD	5MHz: OP.10 TDD	5MHz: OP.10 TDD	5MHz: OP.10 TDD
OCNG Patterns defined in A.3.2.2 (10MHz:	10MHz:	10MHz:	10MHz:
There is no PDSCH allocated in the subframe		OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
transmitting PRS)		20MHz:	20MHz:	20MHz:	20MHz:
		OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD
PRS Transmission Bandwidth (PRS					
transmission bandwidth depends on selected	RB	5MHz: 25	5MHz: 25	5MHz: 25	5MHz: 25 10MHz: 50
channel bandwidth. PRS are transmitted over	KB	10MHz: 50 20MHz:100	10MHz: 50 20MHz:100	10MHz: 50 20MHz:100	20MHz:100
the system bandwidth)		201VITZ. 100	201VITZ. 100	201VITZ. 100	201VIT2.100
Number of consecutive downlink positioning					
subframes $N_{ m PRS}$. $N_{ m PRS}$ also depends on		5MHz: 2	5MHz: 2	5MHz: 2	5MHz: 2
selected channel bandwidth. As defined in TS		10MHz: 1	10MHz: 1	10MHz: 1	10MHz: 1
36.211 [16]. The number of subframes in a		20MHz:1	20MHz:1	20MHz:1	20MHz:1
positioning occasion					
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB	_				
PHICH_RA	dB	0	0	0	0
PHICH_RB	4				
PDCCH_RA	4				
PDCCH_RB	4				
OCNG_RA ^{Note1}	4				
OCNG_RB ^{Note1}	ID.	•			
PRS_RA	dB	-3	0	0	0
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98			
PRS \hat{E}_s/N_{oc}	dB	-6	-6	-6	-13
PRS \hat{E}_{s}/I_{ot}	dB	-6	-6	-6	-13
	-ID /C	-70.04	-70.01	-70.01	-70.01
lo Note3	dBm/9	+10log	+10log	+10log	+10log
	MHz	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)	(N _{RB,c} /50)
PRP Note3	dBm/15kHz	-104	-104	-104	-111
RSRP Note3	dBm/15kHz	-101	-104	-104	-111
\hat{E}_s/N_{oc} Note3	dB	-3	-6	-6	-13
Propagation condition			AW	'GN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes).

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

Note 3: \hat{E}_s/N_{oc} , PRS \hat{E}_s/I_{ot} , RSRP, lo and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. lo values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS.

A.9.8.15.2 Test Requirements

The measurement accuracy of RSTD between Cell1 and Cell3 shall fulfill the requirements in clause 9.1.12.2

The measurement accuracy of RSTD between Cell2 and Cell3 shall fulfill the requirements in clause 9.1.12.2

The measurement accuracy of RSTD between Cell4 and Cell3 shall fulfill the requirements in clause 9.1.12.1.

A.9.9 RSRP and RSRQ on the serving cell

A.9.9.1 FDD Intra frequency serving cell case

A.9.9.1.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP/RSRQ absolute measurement accuracy is within the specified limits. This test will verify the requirements in Clause 9.1.2.1 and 9.1.5.1 for FDD intra frequency measurements.

A.9.9.1.2 Test parameters

In this set of test case there is only the serving cell. Absolute accuracy of RSRP/RSRQ intra frequency measurements for the serving cell is tested by using the parameters in Table A.9.9.1.2-1. In the test case, Cell 1 is the serving cell.

Table A.9.9.1.2-1: RSRP FDD Intra frequency test parameters

5-		11	Test
	ırameter	Unit	Cell 1
E-UTRA RF Ch	nannel Number	5.41.1	1
BW _{channel}		MHz	10
Measurement b		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD
PDSCH allocat		n_{PRB}	13—36
	H/PHICH Reference		
A.3.1.2.1	channel defined in		R.6 FDD
OCNG Patterns (OP.1 FDD)	s defined in A.3.2.1.1		OP.1 FDD
PBCH_RA			
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA PHICH_RB		dB	0
PDCCH_RA		ub.	J
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA ^{Note1}			
OCNG_RB ^{Note1}	I D		400
	Bands FDD_A		-122
	Bands FDD_B Bands FDD_C		-121.5
$N_{oc}^{ m Note2}$			-121 -120.5
IV oc	Bands FDD_D Bands FDD_E,	dBm/15 kHz	
	FDD_F Note 5		-120
	Bands FDD_G Note 7		-119
	Bands FDD_H		-118.5
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	-4
	Bands FDD_A		-126
	Bands FDD_B		-125.5
	Bands FDD_C		-125
	Bands FDD_D		-124.5
RSRP ^{Note3}	Bands FDD_E, FDD_F Note 5	dBm/15 kHz	-124
		•	
	Bands FDD_G Note 7		-123
	Bands FDD_H		-122.5
	Bands FDD_A		
	Bands FDD_B		
	Bands FDD_C		
RSRQ ^{Note3}	Bands FDD_D	dB	-16.25
ווטווע	Bands FDD_E, FDD_F Note 5	uБ	-10.23
	Bands FDD_G Note 7		
	Bands FDD_H		
	Bands FDD_A		-92.76
	Bands FDD_B		-92.26
Io ^{Note3}	Bands FDD_C	dBm/9 MHz	-91.76
	Bands FDD_D		-91.26
	Bands FDD_E, FDD_F Note 5		-90.76

	Bands FDD_G Note 7		-89.76		
Bands FDD_H			-89.26		
\hat{E}_s/N_{oc}		dB	-4		
Propagat	ion condition	-	AWGN		
Note 1: Note 2:	OCNG shall be used such and a constant total transn achieved for all OFDM syn Interference from other cel the test is assumed to be and shall be modelled as A	nitted power speon hools. Is and noise sou constant over sub	ctral density is rces not specified in ocarriers and time		
N_{oc} to be fulfilled. Note 3: RSRP, RSRQ and lo levels have been derived from other					
parameters for information purposes. They are not settable parameters themselves.					
Note 4:	<u>.</u>				
Note 5:	·				
Note 6: Note 7:	E-UTRA operating band gr Except Band 29 and Band	•	ned in Section 3.5.		

A.9.9.1.3 Test Requirements

The absolute RSRP and RSRQ measurement accuracy shall fulfil the requirements in clause 9.1.2.1 and 9.1.5.1 respectively.

A.9.9.2 TDD Intra frequency serving cell case

A.9.9.2.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP/RSRQ absolute measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.2.1 and 9.1.5.1 for TDD intra frequency measurements.

A.9.9.2.2 Test parameters

In this set of test case there is only the serving cell. Absolute accuracy of RSRP/RSRQ intra frequency measurements for the serving cell is tested by using the parameters in Table A.9.9.2.2-1. In the test case, Cell 1 is the serving cell.

Table A.9.9.2.2-1: RSRP TDD Intra frequency test parameters

$\begin{array}{c c} & & & & \\ & & & & \\ \hline & & & & \\ \hline & \hat{E}_s \big/ I_{ot} \\ \hline & & & \\ \hline & & \\ \hline $	MHz n_{PRB} n_{PRB}	Cell 1 1 10 6 1 22—27 R.0 TDD 13—36 R.6 TDD OP.1 TDD	
Special subframe configuration Note1 Uplink/downlink configuration Note1 Weasurement bandwidth PDSCH Reference measurement channel defined in A.3.1.1.2 PDSCH allocation PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2 OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB CONG_RA PDSCH_RB OCNG_RA PDSCH_RB OCNG_RB OCNG	n_{PRB}	6 1 22—27 R.0 TDD 13—36 R.6 TDD OP.1 TDD	
Special subframe configuration Note1 Uplink/downlink configuration Note1 Measurement bandwidth PDSCH Reference measurement channel defined in A.3.1.1.2 PDSCH allocation PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2 OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA PDSCH_RB OCNG_RA POSCH_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB DCC Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_E	n_{PRB}	1 22—27 R.0 TDD 13—36 R.6 TDD OP.1 TDD	
Uplink/downlink configuration Note1 Measurement bandwidth PDSCH Reference measurement channel defined in A.3.1.1.2 PDSCH allocation PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2 OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RA OCNG_RB O	n _{PRB}	22—27 R.0 TDD 13—36 R.6 TDD OP.1 TDD	
PDSCH Reference measurement channel defined in A.3.1.1.2 PDSCH allocation PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2 OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RB PDCCH_RA PDCCH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA POSCH_RB OCNG_RA OCNG_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB A Bands TDD_C Bands TDD_E Bands TDD_C	n _{PRB}	R.0 TDD 13—36 R.6 TDD OP.1 TDD	
channel defined in A.3.1.1.2 PDSCH allocation PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2 OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RB PDCCH_RA PDCCH_RB PDCCH_RA PDSCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA POSCH_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB E Bands TDD_A Bands TDD_C		13—36 R.6 TDD OP.1 TDD	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2 OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA POSCH_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB OCNG_RB A Bands TDD_A Bands TDD_E Bands TDD_E Bands TDD_E Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_E Bands TDD_C Bands TDD_E		R.6 TDD OP.1 TDD	
measurement channel defined in A.3.1.2.2 OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RA POSCH_RB OCNG_RA OCNG_RB OCNG_RB E	dB	OP.1 TDD	
A.3.1.2.2 OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RA PDCCH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA POSCH_RA POSCH_RB OCNG_RA OCNG_RB OCNG_RB E	dB	OP.1 TDD	
OP.1 TDD PBCH_RA	dB		
PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA POSCH_RB OCNG_RB OCNG_RB	dB	0	
SSS_RA	dB	0	
$\begin{array}{c} \text{PHICH_RA} \\ \text{PHICH_RB} \\ \text{PDCCH_RA} \\ \text{PDCCH_RA} \\ \text{PDSCH_RA} \\ \text{PDSCH_RA} \\ \text{PDSCH_RB} \\ \text{OCNG_RA}^{\text{Note2}} \\ \text{OCNG_RB}^{\text{Note2}} \\ \hline N_{oc}^{\text{Note3}} & \text{Bands TDD_A} \\ \text{Bands TDD_C} & \text{Bands TDD_E} \\ \hline \hat{E}_s / I_{\text{ot}} \\ \\ \text{RSRP}^{\text{Note4}} & \text{Bands TDD_A} \\ \text{Bands TDD_C} & \text{Bands TDD_C} \\ \text{Bands TDD_E} \\ \hline \\ \text{RSRQ}^{\text{Note4}} & \text{Bands TDD_A} \\ \text{Bands TDD_A} \\ \\ \text{Bands TDD_C} & \text{Bands TDD_A} \\ \\ \text{Bands TDD_C} & \text{Bands TDD_A} \\ \\ \text{Bands TDD_C} & \text{Bands TDD_A} \\ \\ \text{Bands TDD_C} & \text{Bands TDD_C} \\ \\ \text{Bands TDD_C} & \text{Bands TDD_C} \\ \\ \text{Bands TDD_C} & \text{Bands TDD_C} \\ \\ \text{Bands TDD_E} \\ \\ \end{array}$	dB	0	
$\begin{array}{c} \text{PDCCH_RA} \\ \text{PDCCH_RB} \\ \text{PDSCH_RA} \\ \text{PDSCH_RA} \\ \text{PDSCH_RB} \\ \text{OCNG_RA}^{\text{Note2}} \\ \text{OCNG_RB}^{\text{Note2}} \\ \\ \hline N_{oc}^{ \text{Note3}} & \text{Bands TDD_A} \\ \text{Bands TDD_C} & \text{Bands TDD_E} \\ \\ \hline \hat{E}_s/I_{\text{ot}} & \text{Bands TDD_A} \\ \text{RSRP}^{\text{Note4}} & \text{Bands TDD_C} \\ \text{Bands TDD_E} & \\ \hline \text{RSRQ}^{\text{Note4}} & \text{Bands TDD_A} \\ \text{Bands TDD_A} & \\ \text{Bands TDD_A} \\ \\ \text{RSRQ}^{\text{Note4}} & \text{Bands TDD_A} \\ \\ \text{Bands TDD_C} & \\ \hline \text{Bands TDD_C} & \\ \hline \text{Bands TDD_C} & \\ \hline \text{Bands TDD_C} & \\ \hline \text{Bands TDD_C} & \\ \hline \text{Bands TDD_C} & \\ \hline \text{Bands TDD_C} & \\ \hline \text{Bands TDD_C} & \\ \hline \text{Bands TDD_C} & \\ \hline \end{array}$	dΒ	0	
$\begin{array}{c} \text{PDCCH}_\text{RB} \\ \text{PDSCH}_\text{RA} \\ \text{PDSCH}_\text{RB} \\ \text{OCNG}_\text{RA}^{\text{Note2}} \\ \text{OCNG}_\text{RB}^{\text{Note2}} \\ \hline \\ N_{oc}^{\text{Note3}} & \begin{array}{c} \text{Bands TDD}_\text{A} \\ \text{Bands TDD}_\text{C} \\ \text{Bands TDD}_\text{E} \end{array} \\ \hline \hat{E}_s/I_{ot} & \begin{array}{c} \text{Bands TDD}_\text{A} \\ \text{Bands TDD}_\text{C} \\ \text{Bands TDD}_\text{C} \\ \text{Bands TDD}_\text{C} \\ \text{Bands TDD}_\text{C} \\ \text{Bands TDD}_\text{E} \\ \hline \\ \text{RSRQ}^{\text{Note4}} & \begin{array}{c} \text{Bands TDD}_\text{A} \\ \text{Bands TDD}_\text{A} \\ \text{Bands TDD}_\text{C} \\ \text{Bands TDD}_\text{C} \\ \text{Bands TDD}_\text{C} \\ \\ \text{Bands TDD}_\text{E} \\ \hline \\ \text{Bands TDD}_\text{E} \\ \hline \\ \text{Bands TDD}_\text{E} \\ \hline \\ \end{array}$			
$\begin{array}{c} \text{PDSCH_RA} \\ \text{PDSCH_RB} \\ \text{OCNG_RA}^{\text{Note2}} \\ \text{OCNG_RB}^{\text{Note2}} \\ \\ N_{oc} \\ \end{array} \begin{array}{c} \text{Bands TDD_A} \\ \text{Bands TDD_E} \\ \end{array} \\ \hat{E}_{s} / I_{ot} \\ \\ \text{RSRP}^{\text{Note4}} \\ \\ \text{RSRQ}^{\text{Note4}} \\ \end{array} \begin{array}{c} \text{Bands TDD_A} \\ \text{Bands TDD_C} \\ \text{Bands TDD_E} \\ \end{array} \\ \\ \text{RSRQ}^{\text{Note4}} \\ \end{array} \begin{array}{c} \text{Bands TDD_A} \\ \text{Bands TDD_B} \\ \\ \text{Bands TDD_C} \\ \text{Bands TDD_C} \\ \\ \text{Bands TDD_C} \\ \\ \text{Bands TDD_C} \\ \\ \text{Bands TDD_E} \\ \end{array}$			
$\begin{array}{c} \text{PDSCH_RB} \\ \text{OCNG_RA}^{\text{Note2}} \\ \text{OCNG_RB}^{\text{Note2}} \\ \\ N_{oc}^{\text{Note3}} & \begin{array}{c} \text{Bands TDD_A} \\ \text{Bands TDD_E} \end{array} \\ \\ \hat{E}_{s}/I_{ot} \\ \\ \text{RSRP}^{\text{Note4}} & \begin{array}{c} \text{Bands TDD_A} \\ \text{Bands TDD_C} \\ \text{Bands TDD_C} \end{array} \\ \\ \text{Bands TDD_E} \\ \\ \text{RSRQ}^{\text{Note4}} & \begin{array}{c} \text{Bands TDD_A} \\ \text{Bands TDD_B} \end{array} \\ \\ \text{RSRQ}^{\text{Note4}} & \begin{array}{c} \text{Bands TDD_A} \\ \text{Bands TDD_C} \\ \text{Bands TDD_C} \\ \text{Bands TDD_C} \\ \\ \text{Bands TDD_E} \\ \end{array}$			
$ \begin{array}{c c} \text{OCNG_RB}^{\text{Note3}} & \text{Bands TDD_A} \\ & \text{Bands TDD_C} \\ & \text{Bands TDD_E} \\ \hline \hat{E}_s/I_{\text{ot}} & \\ \hline \\ \text{RSRP}^{\text{Note4}} & \text{Bands TDD_A} \\ & \text{Bands TDD_C} \\ & \text{Bands TDD_E} \\ \hline \\ \text{RSRQ}^{\text{Note4}} & \text{Bands TDD_A} \\ \hline \\ \text{RSRQ}^{\text{Note4}} & \text{Bands TDD_A} \\ \hline \\ \text{Bands TDD_C} & \\ \hline \\ \text{Bands TDD_C} \\ \hline \\ \text{Bands TDD_E} \\ \hline \\ \hline \\ \text{Bands TDD_E} \\ \hline \\ \hline \\ \text{Bands TDD_E} \\ \hline \\ \hline \\ \end{array} $			
$ \begin{array}{c c} \text{OCNG_RB}^{\text{Note3}} & \text{Bands TDD_A} \\ & \text{Bands TDD_C} \\ & \text{Bands TDD_E} \\ \hline \hat{E}_s/I_{\text{ot}} & \\ \hline \\ \text{RSRP}^{\text{Note4}} & \text{Bands TDD_A} \\ & \text{Bands TDD_C} \\ & \text{Bands TDD_E} \\ \hline \\ \text{RSRQ}^{\text{Note4}} & \text{Bands TDD_A} \\ \hline \\ \text{RSRQ}^{\text{Note4}} & \text{Bands TDD_A} \\ \hline \\ \text{Bands TDD_C} & \\ \hline \\ \text{Bands TDD_C} \\ \hline \\ \text{Bands TDD_E} \\ \hline \\ \hline \\ \text{Bands TDD_E} \\ \hline \\ \hline \\ \text{Bands TDD_E} \\ \hline \\ \hline \\ \end{array} $			
$\begin{array}{c} N_{oc} \ ^{\text{Note3}} & \begin{array}{c} \text{Bands TDD_A} \\ \text{Bands TDD_C} \\ \text{Bands TDD_E} \end{array} \end{array}$			
$\begin{array}{c c} & & & & \\ & & & \\ \hat{E}_s/I_{ot} & & & \\ & & & \\ RSRP^{Note4} & & Bands\ TDD_A & \\ & & Bands\ TDD_E & \\ & Bands\ TDD_A & \\ & Bands\ TDD_C & \\ & Bands\ TDD_C & \\ & Bands\ TDD_E & \\ & Bands\ TDD_E & \\ & Bands\ TDD_E & \\ & Bands\ TDD_E & \\ & Bands\ TDD_E & \\ & Bands\ TDD_E & \\ & Bands\ TDD_B $		-122	
$\begin{array}{c c} \hat{E}_s/I_{ot} & & & \\ & & \\ RSRP^{Note4} & & Bands\ TDD_A \\ & Bands\ TDD_E \\ & Bands\ TDD_A \\ \\ RSRQ^{Note4} & & Bands\ TDD_C \\ & Bands\ TDD_C \\ & Bands\ TDD_E \\ \\ & Bands\ TDD_E \\ \end{array}$	dBm/15 kHz	-121	
RSRP ^{Note4} Bands TDD_A Bands TDD_C Bands TDD_E Bands TDD_A RSRQ ^{Note4} Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_E Bands TDD_E		-120	
RSRP ^{Note4} Bands TDD_C Bands TDD_B Bands TDD_A Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_B	dB	-4	
Bands TDD_E Bands TDD_A Bands TDD_C Bands TDD_E Bands TDD_E Bands TDD_A		-126	
RSRQ ^{Note4} Bands TDD_A Bands TDD_C Bands TDD_E Bands TDD_A	dBm/15 kHz	-125	
RSRQ ^{Note4} Bands TDD_C Bands TDD_E Bands TDD_A		-124	
Bands TDD_E Bands TDD_A			
Bands TDD_E Bands TDD_A	dB	-16.25	
Bands TDD A			
		-92.76	
Io ^{Note4} Bands TDD_C			
Bands TDD_E	dBm/9 MHz	-91.76	
\hat{E}_s/N_{oc}	dBm/9 MHz	-91.76 -90.76	
Propagation condition	dBm/9 MHz dB		
Note 1: For special subframe and upli Tables 4.2-1 and 4.2-2 in TS 3 Note 2: OCNG shall be used such that		-90.76	

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP, RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

A.9.9.2.3 Test Requirements

The absolute RSRP and RSRQ measurement accuracy shall fulfil the requirements in section 9.1.2.1 and 9.1.5.1 respectively.

A.10 Proximity-based Services in Any Cell Selection State

A.10.1 E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test

A.10.1.1 Test Purpose and Environment

The purpose of this test is to verify the timing requirements for ProSe Direct Communication transmissions in Any Cell Selection state defined in clause 11.2.

For this test, the UE is triggered by the test loop function or the upper layers to transmit for ProSe Direct Communication.

The test parameters are given in Table A.10.1.1-1 below. There is no serving cell and one active SyncRef UE in this test. The test system shall emulate the SyncRef UE to transmit SLSS and MIB-SL every synchronization period.

The test system will configure the ProSe UE to transmit SLSS in each period (40ms) by configuring *syncTxThreshOoC* as +infinity in the pre-configured parameters. The ProSe UE is expected to synchronize to the SyncRef UE and transmit its own SLSS and SL-MIB in accordance to the procedure specified in clause 5.10.7.3 of TS 36.331.

The transmit timing is verified using the transmission timing of SLSS transmissions.

Table A.10.1.1-1: Test parameters for ProSe Transmission Timig Accuracy test for E-UTRAN FDD

	Parameter	Unit	Value	Comment
E-UTRA RF Channel Number			1	
Channel Bandwic	dth (BW _{channel})	MHz	5 or 10	According to principle defined in clause A.3.12.3
Active cell			None	
Active SyncRef L	JE		SyncRef UE 1	Transmitting SLSS+MIB- SL on uplink of RF channel number 1
	nmunication preconfiguration		As specified in Table A.3.12.5-2 (Configuration #2)	IE values unless specified otherwise in this test.
syncTxThreshOo	С		11 (+infinity)	
N_{oc}		dBm/15 kHz	-98	
	syncCP-Len		Normal	
	syncOffsetIndicator		Set same as syncOffsetIndicator1 in ProSe Direct Communication preconfiguration	
	slssid		30	
	inCoverage		TRUE	In MIB-SL
SyncRef UE 1	networkControlledSyncTx		ON	
,	ProSe Direct Communication resource pool configuration		As specified in Table A.3.12.5-1 (Configuration #1)	IE values unless specified otherwise in this test; Note resource pool is same as Configuration #2 used by ProSe UE.
	\hat{E}_s/N_{oc}		3	
	S-RSRP Note1, Note 2		-95	
Propagation cond	dition		AWGN	

Note 1: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 2: SSSS Es/lot is set the same as PSSS/PSBCH Es/lot.

A.10.1.2 Test Requirements

For parameters specified in Tables A.10.1.1-1, the timing accuracy for ProSe Direct Communication transmissions shall be within the limits defined in clause 11.2.2. The timing accuracy is verified using SLSS transmissions.

Prior to start of test, test system is required to ensure that the ProSe UE is synchronized to the SyncRef UE 1 and is transmitting SLSS + MIB-SL as derived from the SLSS + MIB-SL of SyncRef UE 1 as per clause 5.10.7.3 of TS 36.331. For the test configuration, the SLSSID used by the ProSe UE shall be 30 with *inCoverage* IE in MIB-SL set as FALSE.

The following sequence of events shall be used to verify that the requirements are met.

For 5MHz or 10MHz channel bandwith, the test sequence shall be carried out in Any Cell Selection state.

- a) After the ProSe UE is synchronized to SyncRef UE 1, the test system shall verify that the ProSe UE SLSS transmission timing offset is within \pm 24×T_S with respect to the first detected path (in time) of the corresponding frame of SyncRef UE 1.
- b) The test system adjusts the transmit timing of SyncRef UE 1 by $+24 \times T_S$ compared to that in (a). The test system shall wait for at least one SLSS period (40ms) before verifying the requirement again in (c).
- c) The test system shall verify that the UE SLSS transmissiontiming offset stays within \pm 24×T_S with respect to the first detected path (in time) of the corresponding frame of SyncRef UE 1.

A.10.2 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication

A.10.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirements related to the evaluation time allowed to initiate and cease SLSS transmissions in Any Cell Selection state defined in clause 11.3.

For this test, the UE is triggered by the test loop function or the upper layers to transmit for ProSe Direct Communication.

The test parameters are given in Table A. X.2.1-1 and Table A.10.2.1-2 below. There are no active cells in this test. There is one active SyncRef UE (SyncRef UE 1) in this test. The test system shall emulate SyncRef UE 1 to transmit SLSS and MIB-SL every synchronization period.

Prior to start of test, test system is required to ensure that the ProSe UE is synchronized to the SyncRef UE 1 and is transmitting SLSS + MIB-SL as derived from the SLSS + MIB-SL of SyncRef UE 1 as per clause 5.10.7.3 of TS 36.331. For the test configuration, the SLSSID used by the ProSe UE shall be 30 with *inCoverage* IE in MIB-SL set as FALSE.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the S-RSRP of SyncRef UE 1 is above *syncTxThreshOOC* and the UE is not expected to be transmitting SLSS. During T2, the S-RSRP of SyncRef UE 1 is lowered below *syncTxThreshOOC* and the UE is expected to initiate SLSS transmissions. During T3, the S-RSRP of SyncRef UE 1 is increased back to be above *syncTxThreshOOC* and the UE is expected to cease SLSS transmissions.

Table A.10.2.1-1: Test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth (BW _{channel})	MHz	5 or 10	According to principle defined in clause A.3.12.3
Active cell		None	
Active SyncRef UE		SyncRef UE 1	Transmitting SLSS+MIB- SL on uplink of RF channel number 1
ProSe Direct Communication preconfiguration		As specified in Table A.3.12.5-2 (Configuration #2)	IE values unless specified otherwise in this test.
syncTxThreshOoC	dBm/15 kHz	-95	
T1	S	3	
T2	S	5.24	
T3	S	5.24	

Table A.10.2.1-2: SyncRef UE specific test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	SyncRef UE 1 T1 T2 T3				
Parameter	Unit					
E-UTRA RF Channel Number		1				
BW _{channel} Note 4	MHz		5 or 10			
		As spe	As specified in Table A.3.12.5-1			
ProSe Direct Communication resource pool		(Configuration #1)				
configuration			Note resource pool is same as Configuratio			
		#2 used by ProSe UE.				
syncOffsetIndicator		Set same as syncOffsetIndicator1 in ProS				
Synconsettridicator		Direct Cor	Direct Communication preconfiguration			
slssid		30				
inCoverage			TRUE			
networkControlledSyncTx			ON			

N_{oc} Note1	dBm/15 kHz -96				
\hat{E}_s/N_{oc}	dB	5.5	-3.5	5.5	
S-RSRP Note2, Note3	dBm/15 kHz -90.5 -99.5 -90.5				
Propagation Condition	AWGN				
Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over					
subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.					

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

parameters themselves.

Note 3: SSSS Es/lot is set the same as PSSS/PSBCH Es/lot.

Note 4: This test is according to the principle defined in section A.3.12.3.

A.10.2.2 Test Requirements

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 0.84 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 0.84 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: T_{evaluate SLSS} + SLSS period,

Where:

Note 2:

 $T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 0.8 sec (clause 11.3.2) for the parameters in

this test;

SLSS period is set as 40ms in this test.

A.10.3 E-UTRAN FDD – SyncRef UE Selection / Reselection Test

A.10.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirements related to SyncRef UE selection / reselection in Any Cell Selection state defined in clause 11.5.

For this test, the UE is triggered by the test loop function or the upper layers to transmit for ProSe Direct Communication.

The test parameters are given in Table A. X.3.1-1 and Table A.10.3.1-2 below. There are no active cells in this test. There are two active SyncRef UEs (SyncRef UE 1 and SyncRef UE 2) in this test. The test system shall emulate SyncRef UE 1 and SyncRef UE 2 to transmit SLSS and MIB-SL every SLSS period (40ms).

The test system can verify the selection / reselection of SyncRef UE by monitoring the SLSS ID used by the ProSe UE for its SLSS+MIB-SL transmissions. When the ProSe UE is not synchronized to any SyncRef UE, then the ProSe UE shall use the SLSS ID pre-configured in the ProSe UE. When the ProSe UE is synchronized to a SyncRef UE, the ProSe UE shall derive its SLSS ID from the SLSS ID of the SyncRef UE as per clause 5.10.7.3 of TS 36.331.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. During T1, both SyncRef UE 1 and SyncRef UE 2 are powered off and the ProSe UE is expected to transmit SLSS as an independent synchronization source. During T1, SyncRef UE 1 is powered ON and the ProSe UE will select SyncRef UE 1 as the synchronization source. During T2, a higher priority SyncRef UE 2 is additionally powered ON and the ProSe UE will reselect to the higher priority SyncRef UE 2 as the synchronization source.

Table A.10.3.1-1: Test parameters for SyncRef UE selection/reselection test for E-UTRAN FDD

Pa	arameter	Unit	Value	Comment
Initial condition	Active synchronization		Independent	UE transmits for ProSe Direct
	source		synchronization	Communication and SLSS+MIB-SL
			source	with some random SLSS ID and in-
				coverage set as FALSE in MIB-SL.
T2 end condition			Sync Ref UE 1	UE transmits for ProSe Direct
	source			Communication and SLSS+MIB-SL
				with SLSS ID = 168+59 and in-
				coverage set as FALSE in MIB-SL.
Final condition	Active synchronization		Sync Ref UE 2	UE transmits for ProSe Direct
	source			Communication and SLSS+MIB-SL
				with SLSS ID = 30 and in-coverage
				set as FALSE in MIB-SL.
E-UTRA RF Channel			1	
Channel Bandwidth (E	BW _{channel})	MHz	5 or 10	According to principle defined in
				clause A.3.12.3
Active cell			None	
Active SyncRef UEs			SyncRef UE 1	Transmitting SLSS+MIB-SL on
			SyncRef UE 2	uplink of RF channel number 1
Timing offset between	n SyncRef UE 1 and	ms	3	Asynchronous
SyncRef UE 2				
Frequency offset of S		ppm	0	
Frequency offset of S		ppm	5	
ProSe Direct Commu	nication preconfiguration		As specified in	IE values unless specified
			Table A.3.12.5-2	otherwise in this test.
			(Configuration #2)	
syncTxThreshOoC			11 (+infinity)	
T1		S	24	
T2		S	24	
T3		S	24	

Table A.10.3.1-2: SyncRef UE specific test parameters for SyncRef UE selection/reselection test for E-UTRAN FDD

Donomotor	Unit	S	yncRef UE	1	S	SyncRef UE	2
Parameter	Unit	T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel Number				,	1		
BW _{channel} Note 4	MHz	5 or 10					
ProSe Direct Communication		As specifi	ed in Table	A.3.12.5-2	As specifi	ed in Table	A.3.12.5-1
resource pool configuration		(Co	onfiguration	#2)	(Co	onfiguration	#1)
networkControlledSyncTx			N/A			ON	
syncTxThreshOoC	dBm/15 kHz	+infinity N/A					
slssid		59 30					
inCoverage (in MIB-SL)			FALSE			TRUE	
syncOffsetIndicator		synd	OffsetIndica	ator2	synd	cOffsetIndica	ator1
$N_{\!oc}^{}$ Note1	dBm/15 kHz			-(98		
\hat{E}_s/N_{oc}	dB	-infinity	16	16	-infinity	-infinity	13
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	-infinity	16	2.79	-infinity	-infinity	-3.11
S-RSRP Note2, Note 3	dBm/15 kHz	-infinity	-82	-82	-infinity	-infinity	-85
Propagation Condition		AWGN					

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3: SSSS Es/lot is set the same as PSSS/PSBCH Es/lot.

Note 4: This test is according to the principle defined in section A.3.12.3.

A.10.3.2 Test Requirements

SyncRef UE selection delay is defined as the time from the beginning of T2 to the time UE is synchronized to SyncRef UE 1 and changes its SLSS transmissions timing and SLSS ID to follow SyncRef UE 1 as the synchronization source. For the test configuration, the SLSS ID will be changed to 168+59 (with in-coverage IE in MIB-SL set to FALSE) after SyncRef UE selection delay from start of T2.

The SyncRef UE selection delay shall be less than 20.84sec.

SyncRef UE reselection delay is defined as the time from the beginning of T3 to the time UE changes its synchronization source from SyncRef UE 1 to SyncRef UE 2, and changes its SLSS transmissions timing and SLSS ID to follow SyncRef UE 2 as the synchronization source. For the test configuration, the SLSS ID will be changed o 30 (with in-coverage IE in MIB-SL set to FALSE) after SyncRef UE selection delay from start of T3.

The SyncRef UE reselection delay shall be less than 20.84sec.

The rate of correct SyncRef UE selection / reselection observed during repeated tests shall be at least 90%.

The test system will verify that the ProSe UE does not drop or delay more than 2% of its SLSS transmissions during the duration of T1, T2, and T3.

The SyncRef UE selection/reselection delay can be expressed as:

 $SyncRef\ UE\ selection/reselection\ delay = T_{detect,SyncRef\ UE} + T_{evaluate,SLSS} + SLSS\ period$

Where

- $T_{\text{detect,SyncRef UE}} = 20 \text{sec}$ (as specified in sub-clause 11.5.2.2)
- $T_{\text{evaluate,SLSS}} = 0.8$ (as specified in sub-clause 11.3.2)
- SLSS period = 40ms

This gives a total of 20.84 seconds.

A.10.4 E-UTRAN FDD – Cell Identification on downlink frequency associated with ProSe frequency (when UE is transmitting for ProSe)

A.10.4.1 Test Purpose and Environment

The purpose of this test is to verify cell identification delay requirement for a newly detectable cell on the downink frequency associated with the pre-configured ProSe carrier frequency in Any Cell Selection state. This test will verify the requirements in clause 11.4 when the UE is transmitting for ProSe.

For this test, the UE is triggered by the test loop function or the upper layers to transmit for ProSe Direct Communication.

The test parameters are given in Table A. 10.4.1-1, Table A. 10.4.1-2, and Table A.10.4.1-3 below. There is one active cell (Cell 1) and active SyncRef UE (SyncRef UE 1) in this test. The test system shall emulate SyncRef UE 1 to transmit SLSS and MIB-SL every SLSS period (40ms).

The test consists of two successive time periods, with time duration of T1 and T2 respectively. During T1, the cell is powered OFF and the ProSe UE is synchronized to SyncRef UE 1. During T2, the cell is powered ON and the ProSe UE will detect the cell and attempt to camp on the cell.

Prior to start of test, test system is required to ensure that the ProSe UE is synchronized to the SyncRef UE 1 and is transmitting SLSS + MIB-SL as derived from the SLSS + MIB-SL of SyncRef UE 1 as per clause 5.10.7.3 of TS 36.331. For the test configuration, the SLSSID used by the ProSe UE shall be 30 with *inCoverage* IE in MIB-SL set as FALSE.

Table A.10.4.1-1: Test parameters for cell identification test on on downlink frequency associated with ProSe frequency for E-UTRAN FDD (when UE is transmitting for ProSe)

Parameter	Unit	Value	Comment
Initial condition		Sync Ref UE 1	
Final condition Active synchronization source		Cell1	
E-UTRA RF Channel Number		1	
Channel Bandwidth (BW _{channel})		5 or 10	According to principle defined in clause A.3.12.3
Active cell		Cell1	
Active SyncRef UEs		SyncRef UE 1	Transmitting SLSS+MIB-SL on uplink of RF channel number 1
ProSe Direct Communication preconfiguration		As specified in Table A.3.12.5-2 (Configuration #2)	IE values unless specified otherwise in this test.
syncTxThreshOoC		11 (+infinity)	
T1	S	2	
T2	S	30	

Table A.10.4.1-2: Cell specific test parameters for cell identification test on on downlink frequency associated with ProSe frequency for E-UTRAN FDD (when UE is transmitting for ProSe)

Parameter	Unit	Cell 1		
Farameter	Onn	T1	T2	
E-UTRA RF Channel Number		•	1	
BW _{channel} Note 4	MHz	5 o	r 10	
OCNG Patterns defined in A.3.2.1.2 Note 4		5 MHz: OP.16 FDD 10 MHz: OP.2 FDD		
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB	dB	()	
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA ^{Note 1}				
OCNG_RB ^{Note 1}				
$N_{oc}^{}$ Note2	dBm/15 kHz	-98		
\hat{E}_s/N_{oc}	dB	-infinity	-3	
RSRP Note3	dBm/15 kHz	-infinity	-101	
SCH_RP Note3	dBm/15 kHz	-infinity	-101	
Propagation Condition		AW	'GN	

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

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

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

Note 4: This test is according to the principle defined in section A.3.12.3.

Table A.10.4.1-3: SyncRef UE specific test parameters for cell identification test on on downlink frequency associated with ProSe frequency for E-UTRAN FDD

Parameter	Unit	SyncRe	f UE 1
Parameter		T1	T2
E-UTRA RF Channel Number		1 (Upl	ink)
BW _{channel} Note 4	MHz	5 or	10
ProSe Direct Communication resource pool configuration		As specified in Ta (Configura	
networkControlledSyncTx		ON	
slssid		30	
inCoverage (in MIB-SL)		TRUE	
syncOffsetIndicator		syncOffsetI	ndicator1
$N_{oc}^{$	dBm/15 kHz	-98	3
\hat{E}_s/N_{oc}	dB	13	
S-RSRP Note2, Note3	dBm/15 kHz	-85	
Propagation Condition		AWO	SN

- Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} to be fulfilled.
- Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 3: SSSS Es/lot is set the same as PSSS/PSBCH Es/lot.
- Note 4: This test is according to the principle defined in section A.3.12.3.

A.10.4.2 Test Requirements

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier is defined as the time from the beginning of T2 to the time UE camps on the cell and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST.

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier shall be less than 7.68 s.

The cell selection delay can be expressed as $T_{basic_identify_OoC_ProSe\ Tx_ON} + T_{SI},$ where

- $T_{basic_identify_OoC_ProSe\ Tx_ON} = 6.4sec$ as specified in sub-clause 11.4.2.2
- T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case

This gives a total of 7.68 sec.

Annex B (normative):

Conditions for RRM requirements applicability for operating bands

B.1 Conditions for E-UTRAN RRC_IDLE state mobility

B.1.1 Conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection

This clause defines the E-UTRAN intra-frequency RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection are defined in Table B.1.1-1.

Table B.1.1-1: Conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/lot	SCH Ês/lot
	groups	dBm/15kHz	dBm/15kHz	dB	dB
	FDD_A, TDD_A	-124	-124		
	FDD_B	-123.5	-123.5		
	FDD_C, TDD_C	-123	-123		
	FDD_D	-122.5	-122.5		
Conditions	FDD_E, TDD_E	-122	-122	≥ -4	≥ -4
	FDD_F	-121.5 Note 2	-121.5 Note 2		
	FDD_G	-121	-121		
	FDD_H	-120.5	-120.5		
	FDD_N	-117.5	-117.5		

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Section B.4.2.

NOTE 2: The condition is -122 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.1.2 Conditions for measurements of inter-frequency E-UTRAN cells for cell re-selection

This clause defines the E-UTRAN inter-frequency RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection defined in Table B.1.1-1 also apply for inter-frequency E-UTRAN cells in this section.

B.1.3 Conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection for UE Category M1

This clause defines the E-UTRAN intra-frequency RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot applicable for a corresponding operating band. The UE category M1 applicability of the conditions in Appendix B.1.3 is defined in Section 3.1.

The conditions for CE mode A measurements of FDD and TDD intra-frequency E-UTRAN cells for cell re-selection are defined in Table B.1.3-1 and for E-UTRAN HD-FDD are defined are defined in Table B.1.3-2.

The conditions for CE mode B measurements of FDD and TDD intra-frequency E-UTRAN cells for cell re-selection are defined in Table B.1.3-3 and for E-UTRAN HD-FDD are defined are defined in Table B.1.3-4.

Table B.1.3-1: E-UTRAN intra-frequency measurements for FDD and TDD for CE mode A

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A, TDD_A	-124	
	FDD_D	-122.5	
Conditions	FDD_E, TDD_E	-122	7
Conditions	FDD_F	-121.5 Note 2	→ ≥ -4
	FDD_G	-121	
	FDD_N	-117.5	

NOTE 1: This condition level is increased by ∆>0, when applicable, as described in Sections B.4.2.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table B.1.3-2: E-UTRAN intra-frequency measurements for HD-FDD for CE mode A

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A	-124	
	FDD_D	-122.5	
Conditions	FDD_E	-122	
Conditions	FDD_F	-121.5 Note 2	≥ -4
	FDD_G	-121	
	FDD_N	-117.5	

NOTE 1: This condition level is increased by ∆>0, when applicable, as described in Sections B.4.2.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table B.1.3-3: E-UTRAN intra-frequency measurements for FDD and TDD for CE mode B

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A, TDD_A	-124	
	FDD_D	-122.5	
Conditions	FDD_E TDD_E	-122	\ 10
Conditions	FDD_F	-121.5 Note 2	≥ -13
	FDD_G	-121	
	FDD_N	-117.5	

NOTE 1: This condition level is increased by ∆>0, when applicable, as described in Sections B.4.2.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table B.1.3-4: E-UTRAN intra-frequency measurements for HD-FDD for CE mode B

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A	-124	
	FDD_D	-122.5	
Conditions	FDD_E	-122	\ . 40
Conditions	FDD_F	-121.5 Note 2	≥ -13
	FDD_G	-121	
	FDD_N	-117.5	7

NOTE 1: This condition level is increased by ∆>0, when applicable, as described in Sections B.4.2.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.2 Conditions for UE Measurements Procedures in RRC_CONNECTED State

B.2.1 Conditions for E-UTRAN intra-frequency measurements

This clause defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for intra-frequency E-UTRAN measurements are defined in Table B.2.1-1.

Table B.2.1-1: E-UTRAN intra-frequency measurements

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A, TDD_A	-127	
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
Conditions	FDD_E, TDD_E	-125	≥ -6
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.2.2 Conditions for E-UTRAN intra-frequency measurements with autonomous gaps

This clause defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for intra-frequency E-UTRAN measurements with autonomous gap are as in Table B.2.1-1.

Table B.2.2-1: Void

B.2.3 Conditions for E-UTRAN inter-frequency measurements

This clause defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, RSRP and RSRP Ês/Iot applicable for a corresponding operating band.

The conditions for inter-frequency E-UTRAN measurements with autonomous gap are defined in Table B.2.3-1.

Table B.2.3-1: E-UTRAN inter-frequency measurements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/lot	SCH Ês/lot
	groups	dBm/15kHz	dBm/15kHz	dB	dB
	FDD_A, TDD_A	-125	-125		
	FDD_B	-124.5	-124.5		
	FDD_C, TDD_C	-124	-124		
	FDD_D	-123.5	-123.5		
Conditions	FDD_E, TDD_E	-123	-123	≥ -4	≥ -4
	FDD_F	-122.5 Note 2	-122.5 Note 2		
	FDD_G	-122	-122		
	FDD_H	-121.5	-121.5		
	FDD_N	-118.5	-118.5		

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

B.2.4 Conditions for E-UTRAN inter-frequency measurements with autonomous gaps

This clause defines the E-UTRAN inter-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for inter-frequency E-UTRAN measurements with autonomous gap are defined in Table B.2.4-1.

Table B.2.4-1: E-UTRAN inter-frequency measurements with autonomous gaps

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A, TDD_A	-125	
	FDD_B	-124.5	
	FDD_C, TDD_C	-124	
	FDD_D	-123.5	
Conditions	FDD_E, TDD_E	-123	≥ -4
	FDD_F	-122.5 Note 2	
	FDD_G	-122	
	FDD_H	-121.5	
	FDD_N	-118.5	

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

B.2.5 Conditions for E-UTRAN OTDOA intra-frequency RSTD Measurements

This clause defines the E-UTRAN intra-frequency PRP1,2 applicable for a corresponding operating band

The conditions for E-UTRAN OTDOA intra-frequency RSTD measurements are defined in Table B.2.5-1

NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table B.2.5-1: E-UTRAN OTDOA intra-frequency RSTD measurements

Parameter	E-UTRA operating band groups Note 3	Minimum PRP1,2
		dBm/15kHz
	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
Conditions	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

B.2.6 Conditions for E-UTRAN OTDOA inter-frequency RSTD Measurements

This clause defines the E-UTRAN inter-frequency PRP1,2 applicable for a corresponding operating band.

The conditions for E-UTRAN OTDOA inter-frequency RSTD measurements are defined in Table B.2.5-1.

B.2.7 Conditions for Measurements of the secondary component carrier with deactivated SCell

This clause defines the SCH_RP and SCH Ês/Iot for measurements in the secondary component carrier applicable for a corresponding operating band.

The conditions for measurements of the secondary component carrier with deactivated SCell are defined in Table B.2.7-1.

Table B.2.7-1: Measurements of the secondary component carrier with deactivated SCell

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A, TDD_A	-127	
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
Conditions	FDD_E, TDD_E	-125	≥ -6
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD N	-120.5	

NOTE 1: This condition level is increased by $\Delta>0$, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.2.8 Conditions for E-UTRAN Intra-Frequency Measurements under Time Domain Measurement Resource Restriction

This clause defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for intra-frequency E-UTRAN measurements under time domain measurement resource restriction are defined in Table B.2.8-1.

Table B.2.8-1: E-UTRAN intra-frequency measurements under time domain measurement resource restriction

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A, TDD_A	-127	
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
Conditions	FDD_E, TDD_E	-125	≥ -7.5
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	

- NOTE 1: This condition level is increased by $\Delta > 0$, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
- NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.2.9 Conditions for E-UTRAN Intra-Frequency Measurements under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for intra-frequency E-UTRAN measurements under time domain measurement resource restriction with CRS assistance information are defined in Table B.2.9-1.

Table B.2.9-1: E-UTRAN intra-frequency measurements under time domain measurement resource restriction with CRS assistance information

Parameter	rameter E-UTRA operating band groups Note 3		SCH Ês/lot
		dBm/15kHz	dB
	FDD_A, TDD_A	-127	
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
Conditions	FDD_E, TDD_E	-125	≥ -11.07
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.2.10 Conditions for E-UTRAN intra-frequency discovery signal measurements

This clause defines the E-UTRAN intra-frequency SCH_RP, SCH Ês/Iot in discovery signal occasions [16], applicable for a corresponding operating band for discovery signal measurements

The conditions for E-UTRAN intra-frequency discovery signal measurements are as in Table B.2.1-1.

B.2.11 Conditions for E-UTRAN inter-frequency discovery signal measurements

B.2.11.1 Conditions for E-UTRAN inter-frequency CRS-based measurements

This clause defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, RSRP, and Ês/Iot in discovery signal occasions [16], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for E-UTRAN inter-frequency CRS-based discovery signal measurements in discovery signal occasions are specified in Table B.2.11.1-1.

Table B.2.11.1-1: E-UTRAN inter-frequency discovery signal measurements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/lot	SCH Ês/lot
	groups	dBm/15kHz	dBm/15kHz	dB	dB
	FDD_A, TDD_A	-125	-125		
	FDD_B	-124.5	-124.5		
	FDD_C, TDD_C	-124	-124		
	FDD_D	-123.5	-123.5		
Conditions	FDD_E, TDD_E	-123	-123	≥ -6	≥ -6
	FDD_F	-122.5 Note 2	-122.5 Note 2		
	FDD_G	-122	-122		
	FDD_H	-121.5	-121.5		
	FDD_N	-118.5	-118.5		

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

B.2.11.2 Conditions for E-UTRAN inter-frequency CSI-RS based measurements

This clause defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, CSI-RSRP, and CSI-RS Ês/Iot in discovery signal occasions [16], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for E-UTRAN inter-frequency CRS-based discovery signal measurements in discovery signal occasions are specified in Table B.2.11.2-1.

NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table B.2.11.2-1: E-UTRAN inter-frequency discovery signal measurements

Parameter	E-UTRA operating band groups Note 3	Minimum CSI- RSRP Note 1	Minimum SCH_RP Note 1	CSI-RS Ês/lot	SCH Ês/lot
	groups	dBm/15kHz	dBm/15kHz	dB	dB
	FDD_A, TDD_A	-125	-125		
	FDD_B	-124.5	-124.5		
	FDD_C, TDD_C	-124	-124		
	FDD_D	-123.5	-123.5		
Conditions	FDD_E, TDD_E	-123	-123	≥ 0	≥ -6
	FDD_F	-122.5 Note 2	-122.5 Note 2		
	FDD_G	-122	-122		
	FDD_H	-121.5	-121.5		
	FDD_N	-118.5	-118.5		

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

B.2.12 Conditions for E-UTRAN intra-frequency discovery signal measurements under operation with frame structure 3

This section defines the E-UTRAN intra-frequency SCH_RP in discovery signal occasions [16], applicable for a corresponding operating band for discovery signal measurements under frame structure type 3.

The conditions for E-UTRAN intra-frequency discovery signal measurements are defined in Table B.2.12-1.

Table B.2.12-1: E-UTRAN intra-frequency measurements under operation with frame structure 3

Parameter E-UTRA operating band groups Note 2		Minimum SCH_RP Note 1 dBm/15kHz
Conditions	FS3_G	-124
NOTE 1: Th	is condition level is increased by $\Delta > 0$, when applicable, as described in	Sections B.4.2.
NOTE 2: E-	UTRA operating band groups are as defined in Section 3.5.	

B.2.13 Conditions for E-UTRAN inter-frequency discovery signal measurements under operation with frame structure 3

B.2.13.1 Conditions for E-UTRAN inter-frequency CRS-based measurements

This section defines the E-UTRAN inter-frequency SCH_RP, SCH £s/Iot, RSRP, and £s/Iot in discovery signal occasions [16], applicable for a corresponding operating band for CRS based discovery signal measurements under frame structure 3.

The conditions for E-UTRAN inter-frequency CRS-based discovery signal measurements in discovery signal occasions are specified in Table B.2.13.1-1.

Table B.2.13.1-1: E-UTRAN inter-frequency discovery signal measurements

Parameter	E-UTRA operating band groups Note 2	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/lot	SCH Ês/lot
	groups	dBm/15kHz	dBm/15kHz	dB	dB
	FS3_G	-122	-122	≥ -6	≥ -6
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.					
NOTE 2: E-	UTRA operating band groups are as	defined in Section	3.5.		

NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.2.13.2 Conditions for E-UTRAN inter-frequency CSI-RS based measurements

This section defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, CSI-RSRP, and CSI-RS Ês/Iot in discovery signal occasions [16], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for E-UTRAN inter-frequency CRS-based discovery signal measurements in discovery signal occasions under frame structure 3 are specified in Table B.2.13.2-1.

Table B.2.13.2-1: E-UTRAN inter-frequency discovery signal measurements

Parameter	E-UTRA operating band groups Note 2	Minimum CSI- RSRP Note 1 dBm/15kHz	Minimum SCH_RP ^{Note 1} dBm/15kHz	CSI-RS Ês/lot dB	SCH Ês/lot dB
Conditions	FS3_G	-122	-122	≥ 0	≥ -6
NOTE 4. This condition level is increased by 4.0 when applicable as described in Castiena D.4.2 and D.4.2					

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 2: E-UTRA operating band groups are as defined in Section 3.5.

B.2.14 Conditions for E-UTRAN intra-frequency measurements by UE Category M1

This clause defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band. The UE category M1 applicability of the conditions in Appendix B.2.14 is defined in Section 3.1.

The conditions for CE mode A intra-frequency E-UTRAN FDD and TDD measurements are defined in Table B.2.14-1 and for E-UTRAN HD-FDD measurements are defined in Table B.2.14-2.

The conditions for CE mode B for intra-frequency E-UTRAN FDD and TDD measurements are defined in Table B.2.14-3 and for E-UTRAN HD-FDD measurements are defined in Table B.2.14-4.

Table B.2.14-1: E-UTRAN intra-frequency measurements for FDD and TDD for CE mode A

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A, TDD_A	-127	
	FDD_D	-125.5	
Conditions	FDD_E, TDD_E	-125	
Conditions	FDD_F	-124.5 Note 2	≥ -6
	FDD_G	-124	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table B.2.14-2: E-UTRAN intra-frequency measurements for HD-FDD for CE mode A

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A,	-127	
	FDD_D	-125.5	
Conditions	FDD_E	-125	
Conditions	FDD_F	-124.5 Note 2	≥ -6
	FDD_G	-124	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by ∆>0, when applicable, as described in Sections B.4.2.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table B.2.14-3: E-UTRAN intra-frequency measurements for FDD and TDD for CE mode B

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A, TDD_A	-127	
	FDD_D	-125.5	. 45
Conditions	FDD_E, TDD_E	-125	
Conditions	FDD_F	-124.5 Note 2	≥ -15
	FDD_G	-124	
	FDD N	-120.5	

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Table B.2.14-4: E-UTRAN intra-frequency measurements for HD-FDD for CE mode B

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/lot
		dBm/15kHz	dB
	FDD_A,	-127	
	FDD_D	-125.5	
Conditions	FDD_E	-125	
Conditions	FDD_F	-124.5 Note 2	≥ -15
	FDD_G	-124	
	FDD N	-120.5	

NOTE 1: This condition level is increased by $\Delta>0$, when applicable, as described in Sections B.4.2.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.3 Conditions for measurements performance requirements for UE

B.3.1 Conditions for intra-frequency RSRP and RSRQ Accuracy Requirements

This clause defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements are defined in Table B.3.1-1.

Table B.3.1-1: Intra-frequency absolute RSRP and RSRQ Accuracy Requirements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP ^{Note 1}
		dBm/15kHz
	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
Conditions	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

B.3.2 Void

B.3.3 Conditions for inter-frequency RSRP and RSRQ Accuracy Requirements

This clause defines the E-UTRAN inter-frequency RSRP applicable for a corresponding operating band.

The conditions for inter-frequency absolute RSRP and RSRQ accuracy requirements are defined in Table B.3.1-1.

B.3.4 Conditions for inter-frequency relative RSRP and RSRQ Accuracy Requirements

This clause defines the E-UTRAN inter-frequency RSRP1,2 applicable for a corresponding operating band.

 $The \ conditions \ for \ inter-frequency \ relative \ RSRP \ and \ RSRQ \ accuracy \ requirements \ are \ defined \ in \ Table \ B.3.8-1.$

B.3.5 Conditions for UE Rx – Tx time difference

This clause defines the E-UTRAN RSRP applicable for a corresponding operating band.

The conditions for UE Rx-Tx time difference are defined in Table B.3.1-1.

B.3.6 Conditions for intra-frequency Reference Signal Time Difference (RSTD) measurements

This sections defines the E-UTRAN intra-frequency PRP applicable for a corresponding operating band.

The conditions for intra-frequency RSTD measurements are defined in Table B.2.5-1.

B.3.7 Conditions for inter-frequency RSTD measurements

This sections defines the E-UTRAN inter-frequency PRP applicable for a corresponding operating band.

The conditions for inter-frequency RSTD measurements are defined in Table B.2.5-1.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.3.8 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements

This clause defines the E-UTRAN intra-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements are specified in Table B.3.8-1.

Table B.3.8-1: Intra-frequency relative RSRP accuracy requirements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP1,2 Note 1
		dBm/15kHz
	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
Conditions	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5

NOTE 1: This condition level is increased by ∆>0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.3.9 Conditions for Intra-Frequency Absolute RSRP and RSRQ Accuracy Requirements under Time Domain Measurement Resource Restriction

This clause defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements under time domain measurement resource restriction are as specified in Table B.3.1-1.

B.3.10 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements under Time Domain Measurement Resource Restriction

This clause defines the E-UTRAN intra-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements under time domain measurement resource restriction are defined in Table B.3.8-1.

B.3.11 Conditions for Intra-Frequency Absolute RSRP and RSRQ Accuracy Requirements under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements under time domain measurement resource restriction with CRS assistance information are as specified in Table B.3.1-1.

B.3.12 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN intra-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements under time domain measurement resource restriction with CRS assistance information are as specified in Table B.3.8-1.

B.3.13 Conditions for UE Rx–Tx Time Difference Measurement under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN RSRP applicable for a corresponding operating band.

The conditions for UE Rx-Tx time difference measurements, when time domain measurement resource restriction pattern and CRS assistance information are provided, are as defined in Table B.3.1-1.

B.3.14 Conditions for Intra-Frequency Absolute Discovery Signal Measurement Accuracy Requirements

B.3.14.1 Conditions for Intra-frequency CRS-based measurements

This clause defines the intra-frequency RSRP in discovery signal occasions [16], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table B.3.1-1

B.3.14.2 Conditions for Intra-frequency CSI-RS-based measurements

This clause defines the intra-frequency CSI-RSRP in discovery signal occasions [16], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for intra-frequency absolute CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are specified in Table B.3.14.2-1

Table B.3.14.2-1: Intra-frequency Absolute CSI-RSRP Accuracy Requirements

Parameter	E-UTRA operating band groups Note 3	Minimum CSI-RSRP Note 1
		dBm/15kHz
	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
Conditions	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD N	-120.5

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.3.15 Conditions for Intra-Frequency Relative Discovery Signal Measurement Accuracy Requirements

B.3.15.1 Conditions for Intra-frequency CRS-based measurements

This clause defines the intra-frequency RSRP in discovery signal occasions [16], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for intra-frequency relative RSRP accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table B.3.8-1

B.3.15.2 Conditions for Intra-frequency CSI-RS-based measurements

This clause defines the intra-frequency CSI-RSRP in discovery signal occasions [16], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for intra-frequency relative CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are specified in Table B.3.15.2-1

Table B.3.15.2-1: Intra-frequency Relative CSI-RSRP Accuracy Requirements

Parameter	E-UTRA operating band groups Note 3	Minimum CSI-RSRP1,2 Note 1
		dBm/15kHz
	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
Conditions	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

B.3.16 Conditions for Inter-Frequency Absolute Discovery Signal Measurement Accuracy Requirements

B.3.16.1 Conditions for Inter-frequency CRS-based measurements

This clause defines the inter-frequency RSRP in discovery signal occasions [16], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for inter-frequency absolute RSRP and RSRQ accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table B.3.1-1

B.3.16.2 Conditions for Inter-frequency CSI-RS-based measurements

This clause defines the inter-frequency CSI-RSRP in discovery signal occasions [16], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for inter-frequency absolute CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are as in Table B.3.14.2-1.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

B.3.17 Conditions for Inter-Frequency Relative Discovery Signal Measurement Accuracy Requirements

B.3.17.1 Conditions for Inter-frequency CRS-based measurements

This clause defines the inter-frequency RSRP in discovery signal occasions [16], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for inter-frequency relative RSRP and RSRQ accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table B.3.8-1

B.3.17.2 Conditions for Inter-frequency CSI-RS-based measurements

This clause defines the inter-frequency CSI-RSRP in discovery signal occasions [16], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for inter-frequency relative CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are as in Table B.3.15.2-1.

B.3.18 Conditions for Intra-frequency Absolute RS-SINR Accuracy Requirements

This clause defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RS-SINR accuracy requirements are the same as defined in Table B.3.1-1.

B.3.19 Conditions for Inter-frequency Absolute RS-SINR Accuracy Requirements

This clause defines the E-UTRAN inter-frequency RSRP applicable for a corresponding operating band.

The conditions for inter-frequency absolute RS-SINR accuracy requirements are the same as defined in Table B.3.1-1.

B.3.20 Conditions for Inter-frequency Relative RS-SINR Accuracy Requirements

This clause defines the E-UTRAN inter-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for inter-frequency relative RS-SINR accuracy requirements are the same as defined in Table B.3.8-1.

B.3.21 Conditions for Intra-Frequency Absolute Accuracy Requirements for Measurements under Operation with Frame Structure 3

B.3.21.1 Conditions for RSRP measurements

This clause defines the intra-frequency absolute RSRP during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP accuracy requirements are defined in Table B.3.21.1-1.

Table B.3.21.1-1: Intra-frequency absolute RSRP requirements

Parameter	E-UTRA operating band groups Note 2	Minimum RSRP Note 1
		dBm/15kHz
Conditions	FS3_G	-124
NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 2: E-UTRA operating band groups are as defined in Section 3.5.		

B.3.21.2 Conditions for RSRQ measurements

This clause defines the intra-frequency absolute RSRQ during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRQ accuracy requirements are the same as defined in Table B.3.21.1-1.

B.3.21.3 Conditions for CSI-RSRP measurements

This clause defines the intra-frequency absolute CSI-RSRP during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP accuracy requirements are defined in Table B.3.21.3-1.

Table B.3.21.3-1: Intra-frequency absolute CSI-RSRP requirements

Parameter	E-UTRA operating band groups Note 2	Minimum CSI-RSRP Note 1	
		dBm/15kHz	
Conditions	FS3_G	-124	
NOTE 1: Th	NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.		
NOTE 2: E-UTRA operating band groups are as defined in Section 3.5.			

B.3.22 Conditions for Intra-Frequency Relative Accuracy Requirements for Measurements under Operation with Frame Structure 3

B.3.22.1 Conditions for RSRP measurements

This clause defines the intra-frequency relative RSRP during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements are as defined in Table B.3.22.1-1.

Table B.3.22.1-1: Intra-frequency relative RSRP requirements

Parameter	E-UTRA operating band groups Note 2	Minimum RSRP1,2 ^{Note 1} dBm/15kHz
Conditions	FS3_G	-124
NOTE 1: Th	NOTE 1: This condition level is increased by $\Delta>0$, when applicable, as described in Sections B.4.2 and B.4.3.	
NOTE 2: E-UTRA operating band groups are as defined in Section 3.5.		

B.3.22.2 Conditions for RSRQ measurements

This clause defines the intra-frequency relative RSRQ during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRQ accuracy requirements are the same as defined in Table B.3.22.1-1.

B.3.22.3 Conditions for CSI-RSRP measurements

This clause defines the intra-frequency relative CSI-RSRP during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for intra-frequency relative CSI-RSRP accuracy requirements are as defined in Table B.3.22.3-1.

Table B.3.22.3-1: Intra-frequency relative CSI-RSRP requirements

Parameter	E-UTRA operating band groups Note 2	Minimum CSI-RSRP1,2 Note 1 dBm/15kHz
Conditions	FS3_G	-124
NOTE 1: Th	is condition level is increased by Δ >0, when applicable, as described in Sections	B.4.2 and B.4.3.
NOTE 2: E-	UTRA operating band groups are as defined in Section 3.5.	

B.3.23 Conditions for Inter-Frequency Absolute Accuracy Requirements for Measurements under Operation with Frame Structure 3

B.3.23.1 Conditions for RSRP measurements

This clause defines the inter-frequency absolute RSRP during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for inter-frequency absolute RSRP accuracy requirements are the same as defined in Table B.3.21.1-1.

B.3.23.2 Conditions for RSRQ measurements

This clause defines the inter-frequency absolute RSRQ during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for inter-frequency absolute RSRQ accuracy requirements are the same as defined in Table B.3.21.1-1.

B.3.23.3 Conditions for CSI-RSRP measurements

This clause defines the inter-frequency absolute CSI-RSRP during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for inter-frequency absolute CSI-RSRP accuracy requirements are the same as defined in Table B.3.21.3-1.

B.3.24 Conditions for Inter-Frequency Relative Accuracy Requirements for Measurements under Operation with Frame Structure 3

B.3.24.1 Conditions for RSRP measurements

This clause defines the inter-frequency relative RSRP during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for inter-frequency relative RSRP accuracy requirements are the same as defined in Table B.3.22.1-1.

B.3.24.2 Conditions for RSRQ measurements

This clause defines the inter-frequency relative RSRQ during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for inter-frequency relative RSRP accuracy requirements are the same as defined in Table B.3.22.1-1.

B.3.24.3 Conditions for CSI-RSRP measurements

This clause defines the inter-frequency relative CSI-RSRP during the configured DMTC occasion [2] under operation with frame structure 3 [16], applicable for a corresponding operating band.

The conditions for inter-frequency relative CSI-RSRP accuracy requirements are the same as defined in Table B.3.22.3-1.

B.4 RRM Requirements Exceptions

B.4.1 General

B.4.2 Receiver sensitivity relaxation for UE supporting CA

For a UE supporting inter-band carrier aggregation configuration with uplink in one E-UTRA band, if there is a relaxation of receiver sensitivity $\Delta R_{IB,c}>0$ dB as defined in TS 36.101 [5], Table 7.3.1-1A, the relevant side conditions specifying received power levels (E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) shall be increased by the amount $\Delta=\Delta R_{IB,c}$ defined for each of the downlink E-UTRA bands.

NOTE: This side condition adjustment applies only for a UE supporting a single inter-band LTE CA band combination. For a UE supporting additional inter-band LTE CA band combinations, the $\Delta R_{IB,c}$ for all bands supported by the UE, need to be studied [5].

B.4.3 Receiver sensitivity relaxation for UE configured with CA

B.4.3.1 Inter-band carrier aggregation

In this section, requirements exceptions are described for the UE configured with inter-band carrier aggregation with one uplink active in low operating band.

A relevant side condition (e.g., E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) in a requirement shall be increased by the amount Δ =L2-L1, where L1 is the reference sensitivity level specified in 36.101, Table 7.3.1-1, and L2 is the reference sensitivity level specified in 36.101, Table 7.3.1A-0a, when the following conditions are fulfilled,

- both downlink component carriers on different bands are configured with CA and active,
- the single uplink is active in the low operating band,
- the exception requirements specified in TS36.101, Table 7.3.1A-0a, apply.

If the relaxation Δ specified in this section applies, then the relaxation specified in Section B.4.2 should not be applied.

B.4.3.2 Intra-band non-contiguous carrier aggregation

For a UE configured with intra-band non-contiguous carrier aggregation configuration with uplink in one E-UTRA band, if there is a relaxation of receiver sensitivity $\Delta R_{IBNC}>0$ as defined in TS 36.101 [5], Table 7.3.1A-3, the relevant side conditions specifying received power levels (E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) shall be increased by the amount $\Delta=\Delta R_{IBNC}$ defined for the downlink SCC, when the following conditions are fulfilled,

- both downlink component carriers are configured with CA and active,

- one uplink carrier is active,
- the exception requirements specified in TS36.101, Table 7.3.1A-3, apply.

If the relaxation Δ specified in this section applies, then the relaxation specified in Section B.4.2 should not be applied.

B.4.3.3 Inter-band carrier aggregation with operating bands without uplink band

In this section, requirements are described for the UE configured with inter-band carrier aggregation involving one operating band without uplink band.

There is no relaxation in relevant side condition (e.g., E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) in a requirement, i.e., Δ =0, when the following conditions are fulfilled,

- both downlink component carriers on different bands are configured with CA and active,
- the single uplink is active in the high operating band,
- conditions specified in TS36.101, Table 7.3.1A-0d, apply.

If Δ specified in this section applies, then no other additional relaxation to REFSENS shall be applied.

B.5 Conditions for Measurement Performance Requirements for ProSe UE

B.5.1 Conditions for S-RSRP Accuracy Requirements

This clause defines the S-RSRP applicable for a corresponding operating band.

The conditions for absolute S-RSRP accuracy requirements are defined in Table B.5.1-1.

Table B.5.1-1: Absolute S-RSRP Requirements

	E-UTRA ProSe operating band groups Note 3	Minimum S-RSRP Note 1
		dBm/15kHz
Parameter	FDD_D	-125.5
Parameter	FDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_N	-120.5

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA ProSe operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.

B.5.2 Conditions for Relative S-RSRP Accuracy Requirements

This clause defines the S-RSRP1,2 applicable for a corresponding operating band.

The conditions for relative S-RSRP accuracy requirements are specified in Table B.5.2-1.

Table B.5.2-1: Relative S-RSRP accuracy requirements

	E-UTRA ProSe operating band groups Note 3	Minimum S-RSRP1,2 Note 1
		dBm/15kHz
Doromotor	FDD_D	-125.5
Parameter	FDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_N	-120.5

NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel

bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA ProSe operating band groups are as defined in Section 3.5 for the corresponding E-UTRA

operating bands.

B.5.3 Conditions for Selection/Reselection to Intra-frequency SyncRef UE

This clause defines the ProSe SCH RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for selection/reselection to intra-frequency SyncRef UE are defined in Table B.5.3-1.

Table B.5.3-1: ProSe synchronization measurements

	E-UTRA ProSe operating band groups Note 3	Minimum ProSe SCH_RP	ProSe SCH Ês/lot ^{Note 4}
		dBm/15kHz	dB
Parameter	FDD_D	-125.5	
	FDD_E	-125	
	FDD_F	-124.5 Note 2	≥ -4
	FDD_G	-124	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by $\Delta > 0$, when applicable, as described in Sections B.4.2 and B.4.3.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

NOTE 3: E-UTRA ProSe operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.

NOTE 4: ProSe SCH Ês/lot for a SyncRef UE is the minimum of the Ês/lot of PSSS/PSBCH and the Ês/lot of SSSS

B.5.4 Conditions for SD-RSRP Accuracy Requirements

This clause defines the intra-frequency SD-RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute SD-RSRP accuracy requirements are defined in Table B.5.4-1.

Table B.5.4-1: Absolute SD-RSRP Requirements

	E-UTRA ProSe operating band groups Note 3	Minimum SD-RSRP ^{Note 1} dBm/15kHz
Donomoton	FDD_D	-125.5
Parameter	FDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD N	-120.5

- NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
- NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
- NOTE 3: E-UTRA ProSe operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.

B.5.5 Conditions for Relative SD-RSRP Accuracy Requirements

This clause defines the intra-frequency SD-RSRP applicable for a corresponding operating band.

The conditions for intra-frequency relative S-RSRP accuracy requirements are specified in Table B.5.5-1.

Table B.5.5-1: Relative S-RSRP accuracy requirements

	E-UTRA ProSe operating band groups Note 3	Minimum SD-RSRP1,2 ^{Note 1} dBm/15kHz					
Doromotor	FDD_D	-125.5					
Parameter	FDD_E	-125					
	FDD_F	-124.5 Note 2					
	FDD_G	-124					
	FDD_N	-120.5					
NOTE 1: This condition level is increased by Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.							

- NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
- NOTE 3: E-UTRA ProSe operating band groups are as defined in Section 3.5 for the corresponding E-UTRA operating bands.

Annex C (informative): Change history:

Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2007-12	RP#38	RP-071037				Approved version in TSG RAN#38	8.0.0
2008-03	RP#39	RP-080123	2			Updates of TS36.133	8.1.0
2008-05	RP#40	RP-080325	3			Updates of TS36.133	8.2.0
2008-09	RP#41	RP-080644	006	1		E-UTRAN TDD intra frequency measurements when DRX is used	8.3.0
2008-09	RP#41	RP-080644	800	1		E-UTRAN TDD - UTRAN TDD measurements	8.3.0
2008-09	RP#41	RP-080644	012			RSRQ reporting Range	8.3.0
2008-09	RP#41	RP-080644	018	1		Interfrequency and UTRA interRAT DRX peformance requirements	8.3.0
2008-09	RP#41	RP-080644	020	1		Additions to UE transmit timing requirements	8.3.0
2008-09	RP#41	RP-080644	043			Received interference power measurement performance requirement	8.3.0
2008-09	RP#41	RP-080644	044			Cell Synchronization requirement for E-UTRA TDD	8.3.0
2008-09	RP#41	RP-080644	047			Power Headroom Requirements	8.3.0
2008-09	RP#41	RP-080644	048			Event Triggering and Reporting Criteria Capability Requirements	8.3.0
2008-09	RP#41	RP-080642	004			Correction of E-UTRAN to UTRAN TDD handover	8.3.0
2008-09	RP#41	RP-080642	016	1		Definition of Symbols	8.3.0
2008-09	RP#41	RP-080642	019	1		Idle mode requirements updates	8.3.0
2008-09	RP#41	RP-080642	021	1	<u> </u>	General updates to 36.133	8.3.0
2008-09	RP#41	RP-080642	023	1		Handover requirements for E-UTRAN to cdma200 HRPD/1x	8.3.0
2008-09	RP#41	RP-080642	024			Inter-frequency and inter-RAT measurement requirements for multiple layer monitoring	8.3.0
2008-09	RP#41	RP-080642	025			Side conditions for UE measurement procedures and measurement performance requirements	8.3.0
2008-09	RP#41	RP-080642	026			Correction to cell reselection Requirement from E- UTRAN to HRPD/cdma200 1x	8.3.0
2008-09	RP#41	RP-080642	027			IRAT Measurement requirements in TS 36.133	8.3.0
2008-09	RP#41	RP-080713	022	1		Corrections to Handover requirements	8.3.0
2008-09	RP#41	RP-080713	028			Measurement reporting requirements	8.3.0
2008-09	RP#41	RP-080713	029	2		RRC re-establishment requirements	8.3.0
2008-09	RP#41	RP-080713	032			Correction to UE measurement requirements	8.3.0
2008-09	RP#41	RP-080713	033	+		Correction for the definition of interruption time	8.3.0
2008-09	RP#41	RP-080713	040	1		Correction to idle mode higher priority search requirements	8.3.0
2008-09	RP#41	RP-080713	045			E-UTRAN TDD inter frequency measurement requirements	8.3.0
2008-09	RP#41	RP-080713	046			Updates of the Measurement procedures in RRC_Connected state from RAN 4#47bis and RAN 4#48	8.3.0
2008-12	RP#42	RP-080919	53			Introduction of 700MHz Bands 12, 14 and 17	8.4.0
2008-12	RP#42	RP-080928	88	1		CR to 36.133 on Radio Link Failure Monitoring	8.4.0
2008-12	RP#42	RP-080929	51			Correction to idle mode requirements	8.4.0
2008-12	RP#42	RP-080929	52			Definition of out of service area	8.4.0
2008-12	RP#42	RP-080929	54			Measurement requirements for UTRAN TDD cells in idle state	8.4.0
2008-12	RP#42	RP-080929	69	2		Correction of Inter-RAT UTRA cell reselection requirement	8.4.0
2008-12	RP#42	RP-080929	55			Correction of E_UTRAN cell measurement requirements in idle state	8.4.0
2008-12	RP#42	RP-080930	76		1	Correction to HO Requirements	8.4.0
2008-12	RP#42	RP-080931	71	1	1	Random access requirements	8.4.0
2008-12	RP#42	RP-080932	85		1	Cell phase synchronization error for large cell	8.4.0
2008-12	RP#42	RP-080932	63	4		Synchronization Requirements for E-UTRAN to 1xRTT and HRPD Handovers	8.4.0
2008-12	RP#42	RP-080933	49			E-UTRAN TDD-TDD intra/inter frequency measurement reporting requirements	8.4.0
2008-12	RP#42	RP-080933	50			E-UTRAN FDD – UTRAN FDD Measurement reporting requirements	8.4.0
2008-12	RP#42	RP-080933	58			Measurement requirement for E-UTRAN TDD to UTRAN TDD/FDD when DRX is used	8.4.0
2008-12	RP#42	RP-080933	60	+	1	Interfrequency and GSM measurement performance	8.4.0

					requirements in large DRX	
2008-12	RP#42	RP-080933	62		Correction of implementation margin for transmission gap.	8.4.0
2008-12	RP#42	RP-080933	72		Alignement of DRX cycle dependent requirements	8.4.0
2008-12	RP#42	RP-080933	73	1	Alignement of side conditions for mobility measurements	8.4.0
2008-12	RP#42	RP-080933	66	1	Measurement models in RRC_CONNECTED	8.4.0
2008-12	RP#42	RP-080933	78	1	Limitation of maximum number of layers for multiple	8.4.0
2008-12	RP#42	RP-080933	83	1	monitoring GSM Cell identification requirements for parallel monitoring	8.4.0
2008-12	RP#42	RP-080933	87		UE transmit timing requirement	8.4.0
2008-12	RP#42	RP-080933	56		Correction of TS 36.133 clause 8.1.2.1.1.	8.4.0
2008-12	RP#42	RP-080934	77		Correction to RSRQ Report Mapping	8.4.0
2008-12	RP#42		86		Missing side conditions for RSRP and RSRQ	8.4.0
2008-12	RP#42	RP-080935	81	1	Phase I RRM Test Cases	8.4.0
2008-12	RP#42		80	1	Test Configuration for RRM Tests: Measurement Reference Channels and OCNG	8.4.0
2008-12	RP#42	RP-080936	75		Cdma200 1xRTT Measurement Requirements	8.4.0
2008-12	RP#42	RP-080937	74	1	E-UTRA to UTRA cell search requirements for SON	8.4.0
2009-03	RP#43	RP-090182	101	1	Correction of A3-offset parameter in RRM test case	8.5.0
2009-03	RP#43	RP-090182	105	1	Some Editorial Corrections	8.5.0
2009-03	RP#43	RP-090182	145		Clarifications for the DRX state	8.5.0
2009-03	RP#43	RP-090183	89	1	Modification on measurements of UTRAN TDD cells	8.5.0
2009-03	RP#43	RP-090183	91		Clarification of the correct behavior when Treselection is not a multiple of idle mode reselection evaluation period	8.5.0
2009-03	RP#43	RP-090183	98		Clarification of 'Out of Service Area' Concept and Definition	8.5.0
2009-03	RP#43	RP-090183	118		Radio link monitoring	8.5.0
2009-03	RP#43	RP-090183	142	1	Update of RRC_IDLE state mobility side conditions	8.5.0
2009-03	RP#43	RP-090183	150		UE measurement capability in Idle mode	8.5.0
2009-03	RP#43	RP-090184	133		Removal of RRC re-establishment procedure delay	8.5.0
2009-03	RP#43	RP-090184	138	1	Correction for the UE Re-establishment delay requirement	8.5.0
2009-03	RP#43	RP-090185	92	2	Cell phase synchronization accuracy	8.5.0
2009-03	RP#43	RP-090185	97		Radio link monitoring in DRX	8.5.0
2009-03	RP#43	RP-090185	120		UE Transmit Timing	8.5.0
2009-03	RP#43	RP-090185	137	1	Clarification of the reference point for the UE initial transmission timing control requirement	8.5.0
2009-03	RP#43	RP-090186	90		Correction of clause 8.1.2.2.2.2 in TS36.133	8.5.0
2009-03	RP#43	RP-090186	93	1	cdma2000 1xRTT and HRPD Measurement Requirements	8.5.0
2009-03	RP#43	RP-090186	94		Event Triggered Periodic Reporting Requirements for IRAT Measurements	8.5.0
2009-03	RP#43	RP-090186	95		Measurement Reporting Requirements for E-UTRAN TDD – UTRAN TDD Measurements	8.5.0
2009-03	RP#43	RP-090186	99	1	Clarification of UE behavior when measurement gap is used	8.5.0
2009-03	RP#43	RP-090186	100		E-UTRA to UTRA cell search requirements in DRX for SON	8.5.0
2009-03	RP#43	RP-090186	110	1	Correction to GSM BSIC Requirements for Parallel Monitoring	8.5.0
2009-03	RP#43	RP-090186	117		Alignment of terminology for GAP	8.5.0
2009-03	RP#43	RP-090186	134		Inter frequency and Inter RAT cell search requirement when DRX is used	8.5.0
2009-03	RP#43	RP-090186	139		Correction of E-UTRAN FDD – UTRAN FDD measurements when no DRX	8.5.0
2009-03	RP#43	RP-090186	146		Addition of the definition of "when DRX is used"	8.5.0
2009-03	RP#43	RP-090186	147	1	Corrections to E-UTRAN inter-frequency side conditions	8.5.0

2009-03	RP#43	RP-090187	96		Correction to Intra-frequency RSRP Accuracy	8.5.0
2009-03	RP#43	RP-090187	136	1	Requirements Power Headroom reporting delay	8.5.0
			100		, , ,	
2009-03	RP#43	RP-090370	103	1	E-UTRAN -GSM Handover Test Case	8.5.0
2009-03	RP#43	RP-090370	104	1	E-UTRAN FDD - UTRAN TDD Cell Search Test Cases in Fading	8.5.0
2009-03	RP#43	RP-090370	106	1	E-UTRA FDD to UTRA FDD Handover Test Case	8.5.0
2009-03	RP#43	RP-090370	107	1	Correction of E-UTRA FDD-FDD Intra-frequency cell reselection test case	8.5.0
2009-03	RP#43	RP-090370	108	1	Correction of E-UTRA FDD-FDD priority based Inter- frequency cell reselection test case	8.5.0
2009-03	RP#43	RP-090370	111		E-UTRAN TDD - UTRAN FDD Handover Test Case	8.5.0
2009-03	RP#43	RP-090370	112	1	E-UTRAN FDD - GSM Cell Search Test Case in AWGN	8.5.0
2009-03	RP#43	RP-090370	113		E-UTRAN - UTRAN FDD Cell Search Test Cases in Fading	8.5.0
2009-03	RP#43	RP-090370	114	1	E-UTRAN UE Timing Accuracy Related Test Cases	8.5.0
2009-03	RP#43	RP-090370	115	1	Inclusion of MBSFN Configurations for RRM Test Cases	8.5.0
2009-03	RP#43	RP-090370	116		E-UTRAN FDD HRPD Cell Reselection Test Case; HRPD of Low Priority	8.5.0
2009-03	RP#43	RP-090370	122	1	Clarification on Annex A.9: Measurement performance requirements	8.5.0
2009-03	RP#43	RP-090370	125		E-UTRA TDD – UTRA TDD cell reselection: UTRA is of higher priority	8.5.0
2009-03	RP#43	RP-090370	126		E-UTRA TDD – UTRA TDD cell reselection: UTRA is of lower priority	8.5.0
2009-03	RP#43	RP-090370	127	1	E-UTRA FDD – UTRA TDD cell reselection	8.5.0
2009-03	RP#43	RP-090370	128	1	E-UTRA TDD-UTRA TDD cell search (fading)	8.5.0
2009-03	RP#43	RP-090370	129	1	E-UTRA TDD-UTRA TDD handover	8.5.0
2009-03	RP#43	RP-090370	132	1	Addition of E-UTRA FDD to UTRA FDD reselection test cases	8.5.0
2009-03	RP#43	RP-090370	141	1	Correction and introduction of some test related parameters	8.5.0
2009-03	RP#43	RP-090370	143		Description of Annex A in TS 36.133	8.5.0
2009-03	RP#43	RP-090370	148		Reselection from E-UTRA to GSM cell test case	8.5.0
2009-03	RP#43	RP-090370	149		Radio Link Monitoring Test Cases	8.5.0
2009-05	RP#44	RP-090546	151		E-UTRA FDD UTRA TDD HO delay test case	8.6.0
2009-05	RP#44	RP-090546	153		Correction of CQI reporting periodicity for TDD RLM test cases	8.6.0
2009-05	RP#44	RP-090546	157		Correction to inter RAT reselection requirements to exclude equal priority. (Technically Endorsed CR in R4-50bis - R4-091092)	8.6.0
2009-05	RP#44	RP-090546	167		Clarification of the number of monitoring carriers in idle mode. (Technically Endorsed CR in R4-50bis - R4-091394)	8.6.0
2009-05	RP#44	RP-090546	180		Correction of Core spec references in A.9 Measurements performance test cases	8.6.0
2009-05	RP#44	RP-090546	984		UTRA FDD-E-UTRA FDD/ TDD handover test cases	8.6.0
2009-05	RP#44	RP-090546	184		SON ANR UTRAN FDD Cell Search Test Case	8.6.0
2009-05	RP#44	RP-090546	187		E-UTRAN FDD cdma2000 1x RTT Cell Reselection Test Case; Cdma2000 1X of Low Priority	8.6.0
2009-05	RP#44	RP-090546	188		E-UTRAN FDD cdma2000 HO Test cases	8.6.0
2009-05	RP#44	RP-090546	190		E-UTRAN Random Access Test Cases	8.6.0
2009-05	RP#44	RP-090546	191		E-UTRAN RRC Re-establishment Test Cases	8.6.0
2009-05	RP#44	RP-090546	192		E-UTRAN TDD - GSM Cell Search Test Case in AWGN	8.6.0
2009-05	RP#44	RP-090546	197		Correction to E-UTRAN FDD - GSM Handover Test case	8.6.0
2009-05	RP#44	RP-090546	173	1	Correction of cell reselection test cases	8.6.0
2009-05	RP#44	RP-090546	179	1	Test cases of E-UTRA TDD intra-frequency cell search in fading environment when DRX is used	8.6.0
2009-05	RP#44	RP-090546	152	1	E-UTRA TDD GSM handover test case	8.6.0
2009-05	RP#44	RP-090546	178	1	Test cases of E-UTRA FDD intra-frequency cell search in fading environment when DRX is used	8.6.0
2009-05	RP#44	RP-090546	201	1	Test case for E-UTRA FDD E-UTRA FDD inter frequency cell search when DRX is used in fading conditions	8.6.0
2009-05	RP#44	RP-090546	185	1	Correction to Radio Link Monitoring Tests	8.6.0
	RP#44	RP-090546	203	+	Correction to E-UTRAN FDD to HRPD Cell Reselection	8.6.0

					Patterns for 1.4MHz Bandwidth	
2009-05	RP#44	RP-090546	200	2	Test case for E-UTRA TDD E-UTRA TDD inter frequency cell search when DRX is used in fading	8.6.0
					conditions	
2009-05	RP#44	RP-090547	158		Alignment of inter frequency and inter RAT RRM	8.6.0
					reselection testcases with core requirements.	
2009-05	RP#44	RP-090547	160		(Technically Endorsed CR in R4-50bis - R4-091094) Correction relating E-UTRAN TDD - UE Transmit	8.6.0
2009-05	KP#44	RP-090547	160		Timing Accuracy Tests. (Technically Endorsed CR in	8.6.0
					R4-50bis - R4-091198)	
2009-05	RP#44	RP-090547	165		Modifications of T3 and the verification point for in-sync	8.6.0
					test cases. (Technically Endorsed CR in R4-50bis - R4-	
0000 05	RP#44	DD 000547	172		091386)	0.00
2009-05	KP#44	RP-090547	1/2		E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517)	8.6.0
2009-05	RP#44	RP-090547	171	1	Reference measurement Channels for Radio Link	8.6.0
					Monitoring Tests with 2 Antennas. (Technically	
					Endorsed CR in R4-50bis - R4-091508)	
2009-05	RP#44	RP-090548	170		Misalignment between TS36.133 and TS36.321.	8.6.0
2009-05	RP#44	RP-090548	193		(Technically Endorsed CR in R4-50bis - R4-091457) Correction to Inter-RAT HO Interruption Time Definition	8.6.0
2009-05	RP#44	RP-090548	195		CR c2k RRC delay	8.6.0
2009-05	RP#44	RP-090548	196		CR c2k interruption time	8.6.0
2009-05	RP#44	RP-090548	162		Clarifications to UE UL timing requirements.	8.6.0
					(Technically Endorsed CR in R4-50bis - R4-091357)	
2009-05	RP#44	RP-090548	176		Corrections of Random Access Requirements	8.6.0
2009-05	RP#44	RP-090548	154		Correction of TGRP in clause 8.1.2.1.1	8.6.0
2009-05	RP#44	RP-090548	168		Clarifications for the Relative RSRP and RSRQ	8.6.0
					measurement requirements. (Technically Endorsed CR in R4-50bis - R4-091407)	
2009-05	RP#44	RP-090549	161		E-UTRAN UTRAN HO Command Processing Delay.	8.6.0
2000 00	131 // 11	111 000010	101		(Technically Endorsed CR in R4-50bis - R4-091291)	0.0.0
2009-05	RP#44	RP-090549	175		Corrections of Cell Reselection Requirements in Idle	8.6.0
	55	DD 000510	101	1	Mode	
2009-05	RP#44	RP-090549	181	2	Removal of [] from ranking criteria in Idle mode cell reselection	8.6.0
2009-05	RP#44	RP-090550	156		Correction on the TDD-TDD inter frequency	8.6.0
		1 555555			measurements. (Technically Endorsed CR in R4-50bis -	0.0.0
					R4-091071)	
2009-05	RP#44	RP-090550	159		Correction to the Referenced Clause Number for	8.6.0
					Tinter1. (Technically Endorsed CR in R4-50bis - R4-091153)	
2009-05	RP#44	RP-090551	166		Further clarification of DRX/Non-DRX state.	8.6.0
					(Technically Endorsed CR in R4-50bis - R4-091389)	
2009-05	RP#44	RP-090551	202		Correction on reference to 3GPP2 specification	8.6.0
2009-05	RP#44	RP-090551	169		OCNG simplification. (Technically Endorsed CR in R4-	8.6.0
2009-05	RP#44	RP-090559	155		50bis - R4-091410) Introduction of Extended LTE800 requirements.	9.0.0
2009-03	NF #44	KF-090339	133		(Technically Endorsed CR in R4-50bis - R4-091063)	9.0.0
2009-05	RP#45	RP-090817	211		Correction to TDD RMC references in RLM test cases	9.1.0
2009-05	RP#45	RP-090880	205		Introduction of Reference DRX configurations	9.1.0
2009-05	RP#45	RP-090880	207		Addition of DRX configurations into non DRX test cases	9.1.0
2009-05	RP#45	RP-090880	225		Correction to HO Test Cases	9.1.0
2009-05	RP#45	RP-090880	227		Correction to E-UTRAN GSM BSIC Identification	9.1.0
0000.07	DD#4=	DD 000000	050		Requirements with DRX	0.1.0
2009-05	RP#45	RP-090880	259		Corrections of Test Cases	9.1.0
2009-05	RP#45	RP-090880	314		E-UTRA FDD - E-UTRA FDD and UTRA FDD cell search test cases	9.1.0
2009-05	RP#45	RP-090880	315	+	E-UTRAN Radio Link Monitoring Test Cases in DRX	9.1.0
2009-05	RP#45	RP-090880	316		Inter-frequency E-UTRA - E-UTRA HO test cases:	9.1.0
			<u> </u>		unknown target cell	
2009-05	RP#45	RP-090880	263	2	E-UTRA FDD UTRA FDD Blind Handover test case:	9.1.0
2000 05	DD#45	DD 000000	204	4	unknown target cell	0.4.0
2009-05	RP#45	RP-090836	321	1	Small corrections to Measurements performance tests parameters	9.1.0
2009-05	RP#45	RP-090836	285	1	E-UTRAN GSM Cell Search in DRX Test Cases	9.1.0
2009-05	RP#45	RP-090836	267	+	Set 3.2. E-UTRA TDD to UTRA TDD cell search in DRX	9.1.0
					under fading	
2009-05	RP#45	RP-090836	269		Set 3.6. Test case of E-UTRA TDD to E-UTRA TDD	9.1.0
2000 05	DD#45	DD 000000	274		and UTRA TDD combined cell search under fading	0.4.0
2009-05	RP#45	RP-090836	271		Set 3.12. E-UTRA TDD to UTRA TDD blind handover	9.1.0

2009-05	RP#45	RP-090836	279		E-UTRAN FDD - UTRAN FDD Cell Search in DRX Test	9.1.0
2009-05	RP#45	RP-090836	281		Cases E-UTRAN TDD- E-UTRAN TDD and E-UTRAN TDD	9.1.0
					Inter-frequency Cell Search Test Case	
2009-05	RP#45	RP-090836	283		E-UTRAN GSM Blind Handover Test Cases	9.1.0
2009-05	RP#45	RP-090836	287		E-UTRAN FDD cdma2000 Blind HO Test cases	9.1.0
2009-05	RP#45	RP-090836	302		RRM Test case for multiple E-UTRAN FDD-FDD Inter- frequency event triggered reporting under fading propagation conditions	9.1.0
2009-05	RP#45	RP-090836	304		Fading reselection test case between E-UTRA and UTRA (UTRA of lower priority	9.1.0
2009-05	RP#45	RP-090828	233		CR SI HRPD correction	9.1.0
2009-05	RP#45	RP-090879	215	1	Corrections to Measurements of HRPD cells and cdma2000 1X	9.1.0
2009-05	RP#45	RP-090879	231		CR reference correction	9.1.0
2009-05	RP#45	RP-090879	235	1	Corrections to Measurements of GSM cells in RRC_IDLE	9.1.0
2009-05	RP#45	RP-090879	247		Range of Idle Mode Es/lot side conditions	9.1.0
2009-05	RP#45	RP-090879	249		Removal of [] from Tdetect, Tmeasure and Tevaluate	9.1.0
2009-05	RP#45	RP-090879	245	1	Clarification to applicability of RSRP side conditions in Idle mode	9.1.0
2009-05	RP#45	RP-090879	317		CR Idle mode IF measurement condition	9.1.0
2009-05	RP#45	RP-090879	318	<u> </u>	CR Idle mode IF measurement period	9.1.0
2009-05	RP#45	RP-090879	217	2	Corrections to E-UTRAN RRC_IDLE state mobility requirements	9.1.0
2009-05	RP#45	RP-090814	265	1	Correction to Random Access	9.1.0
2009-05	RP#45	RP-090816	221		E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used	9.1.0
2009-05	RP#45	RP-090816	223		E-UTRAN inter RAT measurement requirements	9.1.0
2009-05	RP#45	RP-090816	229		Correction to Monitoring of Multiple Layers Using Gaps	9.1.0
2009-05	RP#45	RP-090816	219	1	E-UTRAN FDD-FDD inter frequency measurements when DRX is used	9.1.0
2009-05	RP#45	RP-090816	322		CR GSM measurement period	9.1.0
2009-05	RP#45	RP-090816	323		CR cdma2000 1x and HRPD number of carriers	9.1.0
2009-05	RP#45	RP-090816	213	1	Editorial correction on E-UTRAN inter frequency measurements	9.1.0
2009-05	RP#45	RP-090816	261	1	E-UTRAN TDD intra frequency measurements	9.1.0
2009-05	RP#45	RP-090816	319	1	Clarification of the number of monitoring cells for intra frequency measurements	9.1.0
2009-05	RP#45	RP-090815	237		Correction of timing advance adjustment accuracy test case	9.1.0
2009-05	RP#45	RP-090815	291		Correction to UE Transmit Timing Requirements	9.1.0
2009-12	RP-46	RP-091275	329		Defining requirements for UTRA TDD measurements for SON (Technically endorsed at RAN 4 52bis in R4-093512)	9.2.0
2009-12	RP-46	RP-091272	332		Modification of test case of E-UTRA TDD intra frequency cell reselection (Technically endorsed at RAN 4 52bis in R4-093552)	9.2.0
2009-12	RP-46	RP-091272	333		Modification of test case of E-UTRA TDD inter frequency cell reselection (Technically endorsed at RAN 4 52bis in R4-093553)	9.2.0
2009-12	RP-46	RP-091286	334		Introduction of Extended LTE1500 requirements for TS36.133 (Technically endorsed at RAN 4 52bis in R4-093636)	9.2.0
2009-12	RP-46	RP-091272	336		Addition of E-UTRA TDD to UTRA FDD reselection test cases (Technically endorsed at RAN 4 52bis in R4-	9.2.0
2009-12	RP-46	RP-091271	338		093686) Correction of missing accuracy requirements for UTRAN FDD (Technically endorsed at RAN 4 52bis in P4 003680)	9.2.0
2009-12	RP-46	RP-091275	340		R4-093689) CR cdma2000 HRPD measurement period (Technically	9.2.0
2009-12	RP-46	RP-091275	342		endorsed at RAN 4 52bis in R4-093720) CR cdma2000 1x measurement period (Technically endorsed at RAN 4 52bis in R4-093721)	9.2.0
2009-12	RP-46	RP-091272	344		Correction for E-UTRAN FDD - UTRAN FDD Cell Search in DRX Test Cases (Technically endorsed at RAN 4 52bis in R4-093890)	9.2.0
2009-12	RP-46	RP-091272	346		RAIN 4 52bis in R4-093690) Revise geometry factors for Intra freq Reselection Test Cases	9.2.0
2009-12	RP-46	RP-091271	348		Corrections on RRM parameters for Bands 12, 14, 17	9.2.0
2009-12	RP-46	RP-091271	351	1	Corrections to PDSCH RMC-s	9.2.0
2009-12	RP-46	RP-091271	353		Corrections of TS36.133	9.2.0

2009-12	RP-46	RP-091275	356	1	UTRA TDD P-CCPCH RSCP absolute accuracy measurement in E-UTRAN	9.2.0
2009-12	RP-46	RP-091275	358	1	E-UTRAN TDD - UTRAN TDD cell search for SON	9.2.0
2009-12	RP-46	RP-091275	361	'	Cell Search Requirements for Intra-LTE Handover to Unknown Target Cell	9.2.0
2009-12	RP-46	RP-091273	365		Combined E-UTRAN interfrequency and GSM cell search test cases (Scenario set 3.2)	9.2.0
2009-12	RP-46	RP-091271	367	1	Correction in UE UTRA TDD P-CCPCH RSCP measurement capability for R9	9.2.0
2009-12	RP-46	RP-091273	374		E-UTRAN GSM RSSI Measurement Accuracy Tests	9.2.0
2009-12	RP-46	RP-091273	375		E-UTRAN UTRAN FDD CPICH RSCP Measurement Accuracy Tests	9.2.0
2009-12	RP-46	RP-091273	376		E-UTRAN UTRAN FDD CPICH Ec/No Measurement Accuracy Tests	9.2.0
2009-12	RP-46	RP-091275	378		Cell Timing Change Requirements for Event Triggered Reporting	9.2.0
2009-12	RP-46	RP-091271	380		Correction to Power Headroom Requirements	9.2.0
2009-12	RP-46	RP-091271	382		Editorial corrections to 36.133	9.2.0
2009-12	RP-46	RP-091271	387		Editorial corrections to the time units for RRC Re- establishment test cases	9.2.0
2009-12	RP-46	RP-091272	389	1	Introduction of cell search test case in DRX to verify L3 filtering	9.2.0
2009-12	RP-46	RP-091271	391		Correction to ONCG Patterns	9.2.0
2009-12	RP-46	RP-091275	329		Defining requirements for UTRA TDD measurements for SON (Technically endorsed at RAN 4 52bis in R4-093512)	9.2.0
2009-12	RP-46	RP-091272	332		Modification of test case of E-UTRA TDD intra frequency cell reselection (Technically endorsed at RAN 4 52bis in R4-093552)	9.2.0
2009-12	RP-46	RP-091272	333		Modification of test case of E-UTRA TDD inter frequency cell reselection (Technically endorsed at RAN 4 52bis in R4-093553)	9.2.0
2010-03	RP-47	RP-100254	410		Idle mode corrections	9.3.0
2010-03	RP-47	RP-100254	405		UE measurement capability requirements in Idle and	9.3.0
2010-03	RP-47	RP-100254	423	1	Connected Correction to UE Measurement Capability	9.3.0
2010 00	101 47	141 100204	120		Requirements in Idle Mode	0.0.0
2010-03	RP-47	RP-100254	412		Removal of activation time from interRAT handover requirements	9.3.0
2010-03	RP-47	RP-100254	417	1	Correction to UE Transmit Timing Requirements	9.3.0
2010-03	RP-47	RP-100254	402		Correction of E-UTRAN TDD inter frequency measurements_R9	9.3.0
2010-03	RP-47	RP-100254	414	1	Enhanced GSM Requirements for CSFB	9.3.0
2010-03 2010-03	RP-47 RP-47	RP-100254 RP-100255	415 399	1	Enhanced UTRA FDD Requirements for CSFB Correction of RSRP value in E-UTRAN FDDFDD Inter frequency reselection test	9.3.0 9.3.0
2010-03	RP-47	RP-100255	397		Addition of missing Es/Noc parameters in RRM test cases	9.3.0
2010-03	RP-47	RP-100255	421		Correction to RRC Re-establishment Test Case	9.3.0
2010-03	RP-47	RP-100255	427	1	Correction to KRC Re-establishment Test Case Correction of UE transmit timing test case	9.3.0
2010-03	RP-47	RP-100255	419	1	Correction to RLM Test Cases	9.3.0
2010-03	RP-47	RP-100262	407	1	Editorial Corrections in TS36.133(Rel-9)	9.3.0
2010-03	RP-47	RP-100263	413		Introduction of LTE in 800 MHz for Europe requirements in TS 36.133	9.3.0
2010-03	RP-47	RP-100264	395		Corrections for Extended UMTS1500 in TS36.133(Rel- 9)	9.3.0
2010-03	RP-47	RP-100269	393		AOA and TA measurement report mappings	9.3.0
2010-03	RP-47	RP-100269	403	2	Mapping of UE RxTx time difference measurement	9.3.0
2010-03	RP-47	RP-100266	425	2	Home eNode B synchronization requirement	9.3.0
2010-03	RP-47	RP-100266	424	2	Minimum requirements on SI reading for HeNB inbound mobility	9.3.0
2010-06	RP-48	RP-100622	473	ļ	Clarification on radio link monitoring	9.4.0
2010-06	RP-48	RP-100622	472		Corrections of clause numbering on the test case of E- UTRAN FDD-FDD inter-frequency cell search requirements for L3 fitering	9.4.0
2010-06	RP-48	RP-100622	466	1	Correction to RRM Test Cases	9.4.0
2010-06	RP-48	RP-100622	464		Correction to RRM Requirements	9.4.0
2010-06	RP-48	RP-100622	462	1	Correction to Absolute RSRP/RSRQ Definitions	9.4.0
2010-06	RP-48	RP-100622	457		UE Measurement Capability Requirements for CDMA2000	9.4.0
2010-06	RP-48	RP-100622	455	1	Correction of E-UTRAN Inter-frequency Cell Reselection Requirements	9.4.0
2010-06	RP-48	RP-100622	451	1	Correction to idle mode requirements(Rel-9)	9.4.0

2010-06	RP-48	RP-100622	449	1	Editorial corrections to 36.133(Rel-9)	9.4.0
2010-06	RP-48	RP-100622	447	·	Correction to TDD intrafrequency accuracy test case	9.4.0
2010-06		1	1		Correction of Io value in E-UTRAN FDD and TDD Inter	9.4.0
	RP-48	RP-100622	441	1	frequency RSRP tests	
2010-06	RP-48	RP-100627	444	2	Corrections to CSG SI reading core requirement	9.4.0
2010-06	RP-48	RP-100627	445	1	RSRQ idle mode requirements	9.4.0
2010-06	RP-48	RP-100630	470	1	Test cases for R9 cell reselection enhancements	9.4.0
2010-06	RP-48	RP-100630	460		Missing E-UTRA - UTRA FDD DRX Requirements	9.4.0
2010-06	RP-48	RP-100631	442	2	Corrections to enhanced cell identification core	9.4.0
2010-06	RP-48	RP-100631	442		requirement Applicability of mobility requirements with inter-	9.4.0
2010-00	RP-48	RP-100632	469		frequency RSTD measurements	9.4.0
2010-06	111 10	111 100002	100		UE Rx-Tx Time Difference Measurement Requirements	9.4.0
	RP-48	RP-100632	439		for E-CID	
2010-06					CR UE RX-TX time-difference measurement	9.4.0
	RP-48	RP-100632	438	2	requirement	
2010-06	RP-48	RP-100632	433	5	RSTD Measurement Requirements for OTDOA	9.4.0
2010-06	RP-48	RP-100632	432	5	RSTD Accuracy Requirements for OTDOA	9.4.0
2010-09	RP-49	RP-100914	477	1	Cell identity change time in RRM Test cases	9.5.0
2010-09	RP-49	RP-100919	537		A clarification text in the RSTD intra-frequency accuracy requirements	9.5.0
2010-09	RP-49	RP-100920	506		Correction of drx-RetransmissionTimer parameters	9.5.0
2010-09	RP-49	RP-100915	508		Correction of lo value in RSRP FDD and TDD Intra	9.5.0
2010-09	111 -43	100913	300		frequency test	3.3.0
2010-09	RP-49	RP-100920	521	1	Editorial corrections to 36.133 (R9)	9.5.0
2010-09	RP-49	RP-100914	523		Alignment of REFSENS between 36.101 and	9.5.0
					36.133(R9)	
2010-09	RP-49	RP-100920	525	1	Correction of Time to Trigger unit for 36.133(R9)	9.5.0
2010-09	RP-49	RP-100915	505	1	Corrections to 36.133(R9)	9.5.0
2010-09	RP-49	RP-100920	528	1	E-UTRAN FDD Intra Frequency RSTD Measurement	9.5.0
0040.00	DD 40	DD 400040	500	4	Accuracy test case Correction to Enhanced BSIC Verification	0.5.0
2010-09	RP-49	RP-100919	538	1	Requirements	9.5.0
2010-09	RP-49	RP-100919	539		Enhanced CSFB Requirements with DRX	9.5.0
2010-09	RP-49	RP-100919	540		Correction to E-CID Requirements	9.5.0
2010-09	RP-49	RP-100920	544	1	Addition of UTRA and GSM enhanced cell identification	9.5.0
2010 03	111 45	100320	344	'	test cases	0.0.0
2010-09	RP-49	RP-100920	547	1	E-UTRAN FDD UE Rx – Tx Time Difference	9.5.0
					Measurement Accuracy test case	
2010-09	RP-49	RP-100914	479	1	Scrambling code change time in RRM Test cases	9.5.0
2010-09	RP-49	RP-100914	549		Introduction of CSG cell reselection requirements	9.5.0
2010-09	RP-49	RP-100920	527		correction of redundant Hysteresis(Hys) for 36.133(R9)	9.5.0
2010-09	RP-49	RP-100920	488	2	Test case for TDD UE Rx-Tx time difference	9.5.0
					measurement	
2010-09	RP-49	RP-100914	483		Clarification of Radio link monitoring test cases	9.5.0
2010-09	RP-49	RP-100915	485		Test case for E-UTRA TDD event triggered reporting	9.5.0
2010.00	DD 40	DD 400045	407		when L3 filtering is used in R9	0.5.0
2010-09	RP-49	RP-100915	487		E-UTRA TDD - UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority in	9.5.0
					R9	
2010-09	RP-49	RP-100924	492		Test case for E-UTRAN TDD in the existence of non-	9.5.0
					allowed CSG cell	
2010-09	RP-49	RP-100915	494		PDCCH Aggregation level for RRM tests	9.5.0
2010-09	RP-49	RP-100915	503		Correction of ES/lot value in E-UTRAN RSRQ FDD	9.5.0
					intra frequency test	
2010-09	RP-49	RP-100915	496		Corrections to RRM OCNG Patterns	9.5.0
2010-09	RP-49	RP-100919	498		RRC timer accuracy requirement	9.5.0
2010-09	RP-49	RP-100915	501		Correction of OCNG	9.5.0
2010-09	RP-49	RP-100914	477	1	Cell identity change time in RRM Test cases	9.5.0
2010-09	RP-49	RP-100919	537		A clarification text in the RSTD intra-frequency accuracy	9.5.0
0040.00	DD 10	DD 100000	500		requirements	0.5.0
2010-09	RP-49	RP-100920	506		Correction of drx-RetransmissionTimer parameters	9.5.0
2010-09	RP-49	RP-100915	508		Correction of lo value in RSRP FDD and TDD Intra	9.5.0
2010.00	RP-49	DD 100000	524	1	frequency test Editorial corrections to 36 123 (P0)	0.5.0
2010-09 2010-09	RP-49 RP-49	RP-100920 RP-100914	521 523	1	Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and	9.5.0 9.5.0
2010-09	KF-49	KF-100914	523		36.133(R9)	ყ.ა.ს
2010-09	RP-49	RP-100920	525	1	Correction of Time to Trigger unit for 36.133(R9)	9.5.0
2010-09	RP-49	RP-100915	505	1	Corrections to 36.133(R9)	9.5.0
2010-09	RP-49	RP-100920	528	1	E-UTRAN FDD Intra Frequency RSTD Measurement	9.5.0
	-	<u> </u>			Accuracy test case	
				1		

					Requirements	
2010-09	RP-49	RP-100919	539		Enhanced CSFB Requirements with DRX	9.5.0
2010-09	RP-49	RP-100919	540		Correction to E-CID Requirements	9.5.0
2010-09	RP-49	RP-100920	544	1	Addition of UTRA and GSM enhanced cell identification test cases	9.5.0
2010-09	RP-49	RP-100920	547	1	E-UTRAN FDD UE Rx – Tx Time Difference Measurement Accuracy test case	9.5.0
2010-09	RP-49	RP-100914	479	1	Scrambling code change time in RRM Test cases	9.5.0
2010-09	RP-49	RP-100914	549		Introduction of CSG cell reselection requirements	9.5.0
2010-09	RP-49	RP-100920	527		correction of redundant Hysteresis(Hys) for 36.133(R9)	9.5.0
2010-09	RP-49	RP-100920	488	2	Test case for TDD UE Rx-Tx time difference measurement	9.5.0
2010-09	RP-49	RP-100914	483		Clarification of Radio link monitoring test cases	9.5.0
2010-09	RP-49	RP-100915	485		Test case for E-UTRA TDD event triggered reporting when L3 filtering is used in R9	9.5.0
2010-09	RP-49	RP-100915	487		E-UTRA TDD - UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority in R9	9.5.0
2010-09	RP-49	RP-100924	492		Test case for E-UTRAN TDD in the existence of non- allowed CSG cell	9.5.0
2010-09	RP-49	RP-100915	494		PDCCH Aggregation level for RRM tests	9.5.0
2010-09	RP-49	RP-100915	503		Correction of ES/lot value in E-UTRAN RSRQ FDD intra frequency test	9.5.0
2010-09	RP-49	RP-100915	496		Corrections to RRM OCNG Patterns	9.5.0
2010-09	RP-49	RP-100919	498		RRC timer accuracy requirement	9.5.0
2010-09	RP-49	RP-100915	501		Correction of OCNG	9.5.0
2010-09	RP-49	RP-100927	497		CR LTE_TDD_2600_US spectrum band definition additions to TS 36.133	10.0.0
2010-12	RP-50	RP-101331	635		Corrections to 36.133 performance requirements	10.1.0
2010-12	RP-50	RP-101331	638		Correction to intra frequency cell identification time for FDD and TDD	10.1.0
2010-12	RP-50	RP-101331	566	1	Corrections and Clarifications to TS36.133	10.1.0
2010-12	RP-50	RP-101331	592	2	Correction to Radio link monitoring test cases	10.1.0
2010-12	RP-50	RP-101332	563		PDCCH Aggregation Level for RRM Tests	10.1.0
2010-12	RP-50	RP-101332	571		MIMO correlation scenario for RLM test cases	10.1.0
2010-12	RP-50	RP-101332	580		Removal of [] from PDSCH and PCFICH/PDCCH/PHICH Measurement Channel references in Annex A.	10.1.0
2010-12	RP-50	RP-101332	585		Enabling HARQ for RRM Tests	10.1.0
2010-12	RP-50	RP-101335	643	1	Completion of CSG cell reselection requirements	10.1.0
2010-12	RP-50	RP-101343	568		Clarification of measurements requirements for HRPD and cdma2000 1x	10.1.0
2010-12	RP-50	RP-101343	589		Addition of Band 18, 19 and 21 into UE Rx - Tx time difference requirements	10.1.0
2010-12	RP-50	RP-101343	604		Correction to Enhanced GSM Cell Identification Requirement	10.1.0
2010-12	RP-50	RP-101343	632		Correction of reselection requirement for UTRAN FDD cells	10.1.0
2010-12	RP-50	RP-101343	640		Correction to Enhanced UTRA FDD Cell Identification Requirements	10.1.0
2010-12	RP-50	RP-101343	645		E-UTRAN TDD Intra Frequency RSTD Measurement Accuracy test case	10.1.0
2010-12	RP-50	RP-101343	621	1	Correction for Measurements of inter-RAT cells	10.1.0
2010-12	RP-50	RP-101343	598	2	E-UTRAN FDD intra-frequency RSTD measurement reporting delay test case	10.1.0
2010-12	RP-50	RP-101343	600	2	E-UTRAN TDD intra-frequency RSTD measurement reporting delay test case	10.1.0
2010-12	RP-50	RP-101356	644		Band 42 and 43 parameters for UMTS/LTE 3500 (TDD) for TS 36.133	10.1.0
2010-12	RP-50	RP-101361	552	1	Introduction of L-band in TS36.133	10.1.0
2010-12	RP-50	RP-101388	648		Removal of square brackets from scope of TS36.133	10.1.0 10.2.0
2011-04 2011-04	RP-51 RP-51	RP-110359 RP-110340	0658 0663	-	Addition of UE RRM capabilities for CA Correction to E-UTRAN TDD in-sync test requirements	10.2.0
2011-04	RP-51	RP-110340	0665	1	RSTD requirements, RMC and OCNG patterns	10.2.0
2011-04	RP-51	RP-110348	0669	-	CR to 36.133: Aligning relavant RRM requirements for Band 41 with the reference sensitivity values in 36.101	10.2.0
2011-04	RP-51	RP-110339	0676	-	Modification on test case of E-UTRA TDD to UTRA TDD cell reselection(R10)	10.2.0
2011-04	RP-51	RP-110339	0681	1	Value of MS_TXPWR_MAX_CCH for EUTRA-GSM reselection test cases A.4.4.x	10.2.0
2011-04	RP-51	RP-110339	0687	1	Rearrangement of Time periods for EUTRA-UTRA	10.2.0
_0	0,	110000	3001	<u> </u>	reselection test case A.4.3.1.1	. 3.2.0

2011-04	RP-51	RP-110339	0690	1	Removal of "Force to Cell 2" during initialisation for	10.2.0
0044.04	DD 51	DD 440040	0000		EUTRA-UTRA reselection test case A.4.3.1.2	
2011-04	RP-51 RP-51	RP-110340 RP-110408	0693 0697	1	SNR for RRM A.8.x test cases using ETU70 Requirements for Minimaztion of Drive Tests (MDT) in	10.2.0
				·	LTE	
2011-04	RP-51	RP-110339	0703	-	Correction to test cases of E-UTRA to UTRA cell reselection when UE is in idle state	10.2.0
2011-04	RP-51	RP-110359	0706	2	Introduction of measurement requirements for carrier aggregation	10.2.0
2011-04	RP-51	RP-110347	0709	1	Addition of test cases for FDD intra-frequency SI reading using autonomous gaps with both non DRX and	10.2.0
2014 04	RP-51	DD 440047	0744	4	DRX for Rel-10	40.00
2011-04	RP-51	RP-110347	0711	1	Addition of test cases for FDD inter-frequency SI reading using autonomous gaps with both non DRX and DRX for Rel-10	10.2.0
2011-04	RP-51	RP-110359	0713	1	Introduction of core requirements of radio link monitoring in CA	10.2.0
2011-04	RP-51	RP-110339	0719	1	Modification on Test Requirements in E-UTRA - UTRA TDD SON Test Case (A.8.7.3) (R10)	10.2.0
2011-04	RP-51	RP-110348	0727	2	Requirements for reporting criteria with positioning measurements	10.2.0
2011-04	RP-51	RP-110340	0736	-	Correction of RLM evaluation period in DRX	10.2.0
2011-04	RP-51	RP-110340	0739	-	Correction of inter-frequency measurement accuracy test cases	10.2.0
2011-04	RP-51	RP-110339	0744	-	Modification on Test Requirements in E-UTRA GSM cell reselection Test Case (A.4.4) (R10)	10.2.0
2011-04	RP-51	RP-110348	0747	1	Corrections to RSTD measurement for Rel-9	10.2.0
2011-04	RP-51	RP-110348	0748	-	Correction on FDD Intra Frequency RSTD Measurement Accuracy test case	10.2.0
2011-04	RP-51	RP-110348	0751	1	RSTD test case corrections	10.2.0
2011-04	RP-51	RP-110344	0753	-	Correction of serving cell performance requirements for	10.2.0
2011-06	RP-52	RP-110753	0785	1	autonomous SI acquisition Simplification of frequency dependent requirements in	10.3.0
					36.133 (Table B.2.2-1 contains erroneous values. These	
					wrong values will be corrected in the RAN#53 meeting.)	
2011-06	RP-52	RP-110793	754		E-UTRAN FDD-FDD inter-frequency RSTD	10.3.0
					measurement reporting delay test case with the reference cell on the serving carrier frequency	
2011-06	RP-52	RP-110793	755		E-UTRAN TDD-TDD inter-frequency RSTD	10.3.0
					measurement reporting delay test case with the reference cell on the serving carrier frequency	
2011-06	RP-52	RP-110807	757		Core requirements on RRC connection mobility control in CA	10.3.0
2011-06	RP-52	RP-110807	758		Timing core requirements in CA	10.3.0
2011-06	RP-52	RP-110807	759		Introduction of Handover Requirements for Carrier Aggregation	10.3.0
2011-06	RP-52	RP-110793	760		E-UTRAN FDD Inter Frequency RSTD Measurement	10.3.0
2011-06	RP-52	RP-110793	761		Accuracy test case E-UTRAN TDD Inter Frequency RSTD Measurement	10.3.0
2011-06	RP-52	RP-110786	765		Accuracy test case Rearrangement of Time periods for EUTRA-UTRA	10.3.0
2011-06	RP-52	RP-110786	768		reselection test case A.4.3.4.1 Removal of "Force to Cell 2" during initialisation for	10.3.0
					EUTRA -UTRA reselection test cases	
2011-06	RP-52	RP-110807	776		Introduction of UE interruption requirements in SCC measurements with de-activated SCell	10.3.0
2011-06	DD E2	RP-110794	797		Editorial Correction to Cell Re-selection Requirements Correction to side conditions for TDD inter-frequency	10.3.0
	RP-52					10 2 0
2011-06	RP-52	RP-110789	808		CGI identification for Rel-10	10.3.0
	RP-52 RP-52	RP-110789 RP-110786	808 814		CGI identification for Rel-10 Correction to inter-RAT cell identificiation time in DRX for Rel-10	10.3.0
2011-06 2011-06 2011-06	RP-52 RP-52 RP-52	RP-110789 RP-110786 RP-110787	808 814 817		CGI identification for Rel-10 Correction to inter-RAT cell identificiation time in DRX for Rel-10 Correction to identification time of UTRA FDD cell for SON in DRX for Rel-10	10.3.0
2011-06	RP-52 RP-52	RP-110789 RP-110786	808 814		CGI identification for Rel-10 Correction to inter-RAT cell identificiation time in DRX for Rel-10 Correction to identification time of UTRA FDD cell for SON in DRX for Rel-10 Correction to requirements of E-UTRAN TDDUTRAN TDD measurements for SON when DRX is used for	10.3.0
2011-06 2011-06 2011-06	RP-52 RP-52 RP-52	RP-110789 RP-110786 RP-110787	808 814 817		CGI identification for Rel-10 Correction to inter-RAT cell identificiation time in DRX for Rel-10 Correction to identification time of UTRA FDD cell for SON in DRX for Rel-10 Correction to requirements of E-UTRAN TDDUTRAN TDD measurements for SON when DRX is used for Rel-10 Corrrection to the side condition for measurements for	10.3.0
2011-06 2011-06 2011-06 2011-06 2011-06	RP-52 RP-52 RP-52 RP-52 RP-52	RP-110789 RP-110786 RP-110787 RP-110787 RP-110807	808 814 817 822 829 850		CGI identification for Rel-10 Correction to inter-RAT cell identificiation time in DRX for Rel-10 Correction to identification time of UTRA FDD cell for SON in DRX for Rel-10 Correction to requirements of E-UTRAN TDDUTRAN TDD measurements for SON when DRX is used for Rel-10 Corrrection to the side condition for measurements for E-UTRA carrier aggregation CR Timestamp accuracy requirements for MDT	10.3.0 10.3.0 10.3.0 10.3.0
2011-06 2011-06 2011-06 2011-06	RP-52 RP-52 RP-52 RP-52	RP-110789 RP-110786 RP-110787 RP-110787	808 814 817 822 829	1 1 1	CGI identification for Rel-10 Correction to inter-RAT cell identificiation time in DRX for Rel-10 Correction to identification time of UTRA FDD cell for SON in DRX for Rel-10 Correction to requirements of E-UTRAN TDDUTRAN TDD measurements for SON when DRX is used for Rel-10 Corrrection to the side condition for measurements for E-UTRA carrier aggregation	10.3.0 10.3.0 10.3.0

2011-06	RP-52	RP-110807	852	1	Pcmax,c mapping	10.3.0
2011-06	RP-52	RP-110787	771	1	Clarification of Radio link monitoring test requirements	10.3.0
					(The CR was not implemented as it is not based	
					on the latest version of the specification)	
2011-06	RP-52	RP-110807	793	1	E-CID Measurement Requirements under Pcell	10.3.0
					Switching	
2011-06	RP-52	RP-110807	775	1	Removal of undefined intra-freq RSRQ relative	10.3.0
2011 00	1 02	111 110001	10		accuracy requirements in CA	10.0.0
2011-06	RP-52	RP-110789	856		Correction on E-UTRAN FDD RSTD intra frequency	10.3.0
2011-00	111-52	10703	000		case	10.5.0
2011-06	RP-52	RP-110796	800	1	Addition of E-UTRAN FDD/TDD_cdma2000 1xRTT	10.3.0
2011-00	KF-52	KF-110/90	800	ı		10.3.0
2044.00	DD 50	DD 440700	004	1	measurements requirement for SON for Rel-10 Addition of test cases for TDD intra-frequency SI	10.3.0
2011-06	RP-52	RP-110790	804	1		10.3.0
					reading using autonomous gaps with both non DRX and	
0011.00	DD 50	DD 440700	200		DRX for Rel-10	40.00
2011-06	RP-52	RP-110790	806	1	Addition of test cases for TDD inter-frequency SI	10.3.0
					reading using autonomous gaps with both non DRX and	
0011.00	DD 50	DD 440707	200	+.	DRX for Rel-10	40.00
2011-06	RP-52	RP-110787	828	1	Addition of missing EsNoc parameters in E-UTRAN	10.3.0
					TDD UTRAN TDD Measurements test cases for Rel-10	
2011-06	RP-52	RP-110807	835	1	Clarification of UE Rx-Tx time difference measurement	10.3.0
					requirement for carrier aggregation	
2011-06	RP-52	RP-110804	859		Expanded 1900 MHz addition to 36.133	10.3.0
2011-06	RP-52	RP-110811	860		Introduction of RLM requirement for eICIC	10.3.0
2011-06	RP-52	RP-110796	794	1	E-CID Measurement Requirements under Handover	10.3.0
2011-06	RP-52	RP-110811	762	1	CR on RLM requirements for elCIC	10.3.0
2011-06	RP-52	RP-110811	788	2	RSRP and RSRQ measurement requirements for elCIC	10.3.0
2011-06	RP-52	RP-110811	851	1	CR on RSRP and RSRQ measurement accuracy	10.3.0
2011 00	111 02	10011	001	'	requirements for eICIC	10.0.0
2011-06	RP-52	RP-110807	802	2	Addition of OTDOA measurement requirement for E-	10.3.0
2011-00	111-52	10007	002	-	UTRAN carrier aggregation	10.5.0
2011-09	RP-53	RP-111246	060		Thresholds and margins for reporting of neighbour cells	10.4.0
2011-09	KP-53	KP-111246	863			10.4.0
0011.00	DD 50	DD 444040	200		in RRM test A.8.9.1	40.40
2011-09	RP-53	RP-111246	902		Thresholds and margins for RRM tests A.5.2.1 and	10.4.0
					A.5.2.2	
2011-09	RP-53	RP-111246	905		Thresholds and margins for RRM tests A.5.2.4 and	10.4.0
					A.5.2.5	
2011-09	RP-53	RP-111247	889		Removing [] in clause 8.1.2.2.2.2 for Rel-10	10.4.0
2011-09	RP-53	RP-111247	915		Adding condition of UTRA TDD measurement report	10.4.0
					delay requirements applied	
2011-09	RP-53	RP-111247	930		Clarify time points and time duration for RLM tests	10.4.0
					A.7.3.x	
2011-09	RP-53	RP-111251	926	1	Adding enhanced UTRA TDD cell identification	10.4.0
					requirements for Rel-10	
2011-09	RP-53	RP-111251	969		CR for E-UTRAN FDD GSM event triggered reporting	10.4.0
	00				in AWGN with enhanced BSIC identification in R10	
2011-09	RP-53	RP-111252	894		Requirements for RRC Connection Release with	10.4.0
2011-03	111 -55	101-111202	054		Redirection	10.4.0
2011-09	RP-53	RP-111252	960		Missing RSRQ in Intra-frequency measurement	10.4.0
2011-09	KF-55	KF-111232	900			10.4.0
2011 00	DD 52	DD 111050	065	1	requirements Paguirements for PBC Connection Release with	10.40
2011-09	RP-53	RP-111252	965	1	Requirements for RRC Connection Release with	10.4.0
0044.00	DD 50	DD 444055	0.40	1	Redirection for TDD in R10	40.40
2011-09	RP-53	RP-111255	946		Introduction of Band 22	10.4.0
2011-09	RP-53	RP-111255	979	1	Modifications of Band 42 and 43	10.4.0
2011-09	RP-53	RP-111263	879	1	Correction to RRC connection mobility control in CA	10.4.0
2011-09	RP-53	RP-111263	895	2	RSTD Measurement Requirements under Handover	10.4.0
2011-09	RP-53	RP-111263	896	2	RSTD Measurement Requirements under Pcell	10.4.0
					Switching	
2011-09	RP-53	RP-111263	920	1	Editorial corrections for 36.133 (Rel-10)	10.4.0
2011-09	RP-53	RP-111263	924	1	Correction to RRC connection mobility control in CA	10.4.0
2011-09	RP-53	RP-111263	927	+	Modifications on TDD inter frequency measurements	10.4.0
_000	50	1 111200			with autonomous gaps	. 5
2011-09	RP-53	RP-111263	945	1	Frequency band related requirements to 36.133	10.4.0
2011-09	RP-53	RP-111263	949	1	Correction of references	10.4.0
				1		
2011-09	RP-53	RP-111263	950	1	Alignment of the carrier aggregation terminology	10.4.0
2011-09	RP-53	RP-111263	951	1	Band simplification for core requirements	10.4.0
2011-09	RP-53	RP-111263	952		Clarification in inter-frequency RSTD accuracy tests	10.4.0
2011-09	RP-53	RP-111263	953	1	Editorial corrections for RRM requirements	10.4.0
2011-09	RP-53	RP-111263	961		Missing RSRQ in E-UTRA carrier aggregation	10.4.0
					measurement requirements	
2011-09	RP-53	RP-111265	874	1	Clarification of TDD uplink-downlink subframe	10.4.0
	55	1	1	1	configurations applicability for RSTD measurement in	. 3
					CA	
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2011-09	RP-53	RP-111265	875	3		CR on UE interruption requirements in SCC measurements with de-activated SCell when common DRX is used	10.4.0
2011-09	RP-53	RP-111265	883	1		Alignment of terminology for SCell measurement cycle	10.4.0
2011-09	RP-53	RP-111265	921	1		Introduction of Pcmax,c reporting requirements for carrier aggregation	10.4.0
2011-09	RP-53	RP-111266	849	3		RSTD Accuracy Requirements for Carrier Aggregation	10.4.0
2011-09	RP-53	RP-111266	898	1		Introduction of power headroom reporting requirement for carrier aggregation	10.4.0
2011-09	RP-53	RP-111308	891	1		RSRP and RSRQ measurement requirements for elCIC	10.4.0
2011-12	RP-54	RP-111681	982			Corrections of inter-frequency measurement accuracy RSRP and RSRQ test cases	10.5.0
2011-12	RP-54	RP-111682	984			Removing [] in CSFB requirement for Rel-10	10.5.0
2011-12	RP-54	RP-111693	985			Reference channel for RLM testing with elCIC	10.5.0
2011-12	RP-54	RP-111683	987			Clarification on RSTD test cases	10.5.0
2011-12	RP-54	RP-111690	988			RSRP Measurement performance lo corrections	10.5.0
2011-12	RP-54	RP-111686	989			RLM measurement requirements for elCIC	10.5.0
2011-12	RP-54	RP-111693	990			PDCCH/PCFICH transmission parameters for RLM	10.5.0
2011-12	RP-54	RP-111683	992	1		Clarification on PRS bandwidth	10.5.0
2011-12	RP-54	RP-111735	993			Missing RSRQ in intra-frequency measurement requirements for elClC	10.5.0
2011-12	RP-54	RP-111686	994	1		Test case for TDD RSRQ Accuracy for Carrier Aggregation	10.5.0
2011-12	RP-54	RP-111686	995	†		Cell identification requirements without DRX	10.5.0
2011-12	RP-54	RP-111693	997	1		Test case for cell identification with eICIC in E-UTRAN FDD	10.5.0
2011-12	RP-54	RP-111693	998	1		Test case for cell identification with eICIC in E-UTRAN TDD	10.5.0
2011-12	RP-54	RP-111691	999	1		Carrier aggregation RSRP measurement test case for TDD	10.5.0
2011-12	RP-54	RP-111690	1001			Test case for enhanced UTRA TDD cell identification for R10	10.5.0
2011-12	RP-54	RP-111690	1003			Test case for RRC connection release redirection to UTRA TDD for R10	10.5.0
2011-12	RP-54	RP-111735	1005			Clarification of the Successful Percentage for Measurement Performance Requirements	10.5.0
2011-12	RP-54	RP-111691	1007	2		FDD Absolute and Relative RSRQ Accuracy test in CA	10.5.0
2011-12	RP-54	RP-111691	1011	1		FDD absolute and relative RSRP accuracies test in CA	10.5.0
2011-12	RP-54	RP-111693	1014	1		E-UTRAN TDD Radio Link Monitoring Test for Out-of- sync under time domain measurement resource restriction	10.5.0
2011-12	RP-54	RP-111735	1016			E-UTRAN FDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions in R10	10.5.0
2011-12	RP-54	RP-111735	1018	1		E-UTRAN FDD RRC connection release with redirection to UTRAN TDD in R10	10.5.0
2011-12	RP-54	RP-111735	1021	1		CR for Inter-RAT SI reading	10.5.0
2011-12	RP-54	RP-111687	1022			Addition of E-UTRAN FDD - TDD Inter frequency cell reselection test case	10.5.0
2011-12	RP-54	RP-111687	1023			Addtion of E-UTRAN TDD - FDD Inter frequency cell reselection test case	10.5.0
2011-12	RP-54	RP-111687	1024			Addtion of E-UTRAN FDD - TDD Inter frequency handover test case	10.5.0
2011-12	RP-54	RP-111687	1025			Addtion of E-UTRAN TDD - FDD Inter frequency handover test case	10.5.0
2011-12	RP-54	RP-111687	1026			Addition of E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells test case	10.5.0
2011-12	RP-54	RP-111687	1027	1		Addtion of E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells test case	10.5.0
2011-12	RP-54	RP-111687	1028			Addtion of E-UTRAN FDD - TDD inter frequency measurement accuracy test case	10.5.0
2011-12	RP-54	RP-111681	1031			Correction for the identification time in DRX for UTRA TDD in R10	10.5.0
2011-12	RP-54	RP-111735	1032			Correction the side condition for SCH in R10	10.5.0
2011-12	RP-54	RP-111735	1033	1		Correction to event triggered reporting for TS 36.133 in R10	10.5.0
2011-12	RP-54	RP-111681	1039	1		Correction of E-UTRAN TDD-TDD inter frequency handover test case in R10	10.5.0
2011-12	RP-54	RP-111735	1041			Clarification of Expected RSTD and Expected RSTD uncertainty in RSTD test cases in R10	10.5.0
2011-12	RP-54	RP-111680	1043			Thresholds and margins for RRM tests A.8.11.3 and A.8.11.4	10.5.0

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2011-12	RP-54	RP-111683	1046		Thresholds and margins for RRM tests A.8.11.5 and A.8.11.6	10.5.0
2011-12	RP-54	RP-111693	1047	2	RLM Out of Sync Detection Test for eICIC	10.5.0
2011-12	RP-54	RP-111683	1049		RRC Connection Release with Redirection from E- UTRAN FDD to GERAN	10.5.0
2011-12	RP-54	RP-111693	1051		Colliding CRS in non-MBSFN ABS	10.5.0
2011-12	RP-54	RP-111683	1052		RRC Connection Release with Redirection from E- UTRAN TDD to GERAN	10.5.0
2011-12	RP-54	RP-111693	1053	1	RLM In Sync Detection Test for FDD eICIC	10.5.0
2011-12	RP-54	RP-111693	1054	1	RLM In Sync Detection Test for FDD eICIC	10.5.0
2011-12	RP-54	RP-111691	1055	1	FDD Event triggered reporting on deactivated Scell in non-DRX	10.5.0
2011-12	RP-54	RP-111691	1056	1	TDD Event triggered reporting on deactivated Scell in non-DRX	10.5.0
2011-12	RP-54	RP-111683	1058		Adding Band XX	10.5.0
2011-12	RP-54	RP-111690	1061	1	Optional faster higher priority reselection	10.5.0
2011-12	RP-54	RP-111735	1064	1	Addition of a test case at lower RSRP level for the serving cell measurement accuracy	10.5.0
2011-12	RP-54	RP-111683	1066		Test cases for RRC connection release with redirection to UTRAN FDD	10.5.0
2011-12	RP-54	RP-111735	1072		CA definition alignment in test cases	10.5.0
2011-12	RP-54	RP-111683	1074		Applicable PRS BW for RSTD accuracy requirements	10.5.0
2012-03	RP-55	RP-120304	1077	1	RSTD signalling modifications	10.6.0
2012-03	RP-55	RP-120294	1079	1	Test case for E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided for R10	10.6.0
2012-03	RP-55	RP-120294	1081	1	Test case for E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided for R10	10.6.0
2012-03	RP-55	RP-120291	1084		Thresholds and margins for E-UTRAN to C2K RRM reselection test cases (Rel-10)	10.6.0
2012-03	RP-55	RP-120294	1087		Addition of E-UTRAN TDD-HRPD Cell Reselection: HRPD is of Lower Priority test case R10	10.6.0
2012-03	RP-55	RP-120293	1089		Addition of E-UTRAN TDD-cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority test case R10	10.6.0
2012-03	RP-55	RP-120293	1091		Addition of E-UTRAN TDD-HRPD Handover test case R10	10.6.0
2012-03	RP-55	RP-120294	1093		Addition of E-UTRAN TDD-cdma2000 1X Handover test case R10	10.6.010. 6.0
2012-03	RP-55	RP-120294	1099		Addition of E-UTRAN FDD-TDD inter frequency RSRQ measurement accuracy test case R10	10.6.0
2012-03	RP-55	RP-120300	1112	1	RLM test cases with SNRs for OOS and INS for E- UTRAN TDD in elCIC	10.6.0
2012-03	RP-55	RP-120304	1115		lo difference band-independent in Inter-frequency RSRP TDD TC A.9.1.4	10.6.0
2012-03	RP-55	RP-120292	1118	1	Thresholds and margins in RRM test case A.8.11.4	10.6.0
2012-03	RP-55	RP-120292	1121		TDD PRACH Test cases value of PRACH Configuration Index and first preamble power	10.6.0
2012-03	RP-55	RP-120292	1124	1	PDSCH and OCNG pattern in PRACH Test cases A.6.2.1 and A.6.2.3	10.6.0
2012-03	RP-55	RP-120300	1134	1	Clarification of colliding CRS in MBSFN ABS	10.6.0
2012-03	RP-55	RP-120304	1135		Editorial corrections on the test cases of RRC connection release with redirection to UTRAN FDD	10.6.0
2012-03	RP-55	RP-120304	1139	1	Corrections on test case of Event triggered reporting on deactivated Scell in non-DRX CR not implemented as it is based on the wrong version of the spec	10.6.0
2012-03	RP-55	RP-120304	1140		Core requirements for E-UTRAN TDD inter-RAT UTRAN FDD SI acquisition using autonomous gaps	10.6.0
2012-03	RP-55	RP-120304	1143	1	Editorial corrections	10.6.0
2012-03	RP-55	RP-120300	1145	1	Side condition clarification for eICIC with MBSFN	10.6.0
2012-03	RP-55	RP-120300	1146		Clarification on reported cells with eICIC	10.6.0
2012-03	RP-55	RP-120294	1148		Correction of RSTD accuracy test cases for TDD	10.6.0
2012-03	RP-55	RP-120300	1151	2	RLM requirements with autonomous gaps	10.6.0
2012-03	RP-55	RP-120300	1152	1	SNR levels in out-of-sync RLM test cases for elCIC	10.6.0
2012-03	RP-55	RP-120303	1156	1	CR for 36.133: B41 REFSENS and MOP changes to accommodate single filter architecture	10.6.0
2012-03	RP-55	RP-120300	1157		eICIC measurement accuracy	10.6.0
2012-03	RP-55	RP-120307	1154	1	Introduction of Band 26/XXVI to TS 36.133	11.0.0
2012-06	RP-56	RP-120782	1162		Resolve Band 41 omission between R4-120125 and R4-121106	11.1.0
2012-06	RP-56	RP-120770	1165	1	Corrections to FDD-TDD Inter-freq RSRP measurement accuracy test case parameters	11.1.0
2012-06	RP-56	RP-120771	1168		OCNG and PDSCH for FDD-TDD event triggered	11.1.0

					reporting test cases	
2012-06	RP-56	RP-120771	1171		RRC Connection Release with Redirection from E-	11.1.0
2012-06	RP-56	RP-120771	1174		UTRAN FDD to GERAN without System Information RRC Connection Release with Redirection from E-	11.1.0
2012 00	111 30	101-120771	1174		UTRAN TDD to GERAN without System Information	11.1.0
2012-06	RP-56	RP-120784	1176		OCNG Patterns for MBSFN ABS	11.1.0
2012-06	RP-56	RP-120769	1183		Addition of E-UTRAN TDD-FDD Inter-frequency event	11.1.0
					triggered reporting when DRX is used under fading propagation conditions in asynchronous cells test case	
					R11	
2012-06	RP-56	RP-120769	1186		Addition of E-UTRAN TDD - FDD Inter-frequency	11.1.0
					identification of a new CGI of E-UTRA cell using	
0040.00	DD 50	DD 400700	1100		autonomous gaps test case R11	44.4.0
2012-06	RP-56	RP-120769	1189		Addition of E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading	11.1.0
					propagation conditions in asynchronous cells R11	
2012-06	RP-56	RP-120769	1192		Addition of E-UTRAN FDD - TDD Inter-frequency	11.1.0
					identification of a new CGI of E-UTRA cell using	
2042.00	RP-56	DD 400777	4405	1	autonomous gaps test case R11	44.4.0
2012-06	RP-56	RP-120777	1195	1	Addition of E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions test case	11.1.0
					R11	
2012-06	RP-56	RP-120769	1198		Addition of E-UTRAN TDD-CDMA2000 1X event	11.1.0
					triggered reporting under fading propagation conditions	
2042.00	RP-56	RP-120770	1201		test case R11 E-UTRA TDD RRC connection release redirection to	11.1.0
2012-06	RP-56	RP-120770	1201		UTRA FDD test without SI provided R11	11.1.0
2012-06	RP-56	RP-120784	1205	1	FDD RSRQ under Time Domain Measurement	11.1.0
					Resource Restriction with Non-MBSFN ABS R11	
2012-06	RP-56	RP-120784	1207	1	TDD RSRQ under Time Domain Measurement	11.1.0
		DD 100700	1010		Resource Restriction with Non-MBSFN ABS R11	
2012-06	RP-56	RP-120780	1213		CR to TS36.133 Corrections on RRC signalling in RLM test cases for elClC	11.1.0
2012-06	RP-56	RP-120773	1223		Test case for event-triggered reporting on deactivated	11.1.0
2012 00	141 00	111 120770	1220		SCell with PCell interruption	111110
2012-06	RP-56	RP-120770	1227	1	Finalization of Rel.9 cell reselection enhancement	11.1.0
					related test cases	
2012-06	RP-56	RP-120770	1231		E-UTRAN FDD to UTRAN FDD RRC connection release with redirection test case when SI is not	11.1.0
					provided	
2012-06	RP-56	RP-120781	1233		No interruptions on PCell at SCell activation/	11.1.0
					deactivation when measCycleSCell is smaller than 640	
					ms	
2012-06	RP-56	RP-120780	1235	1	Editorial corrections	11.1.0
2012-06 2012-06	RP-56 RP-56	RP-120782 RP-120784	1237 1239	1	Reporting criteria requirements for carrier aggregation Cell identification requirements with DRX	11.1.0
2012-06	RP-56	RP-120784	1241	1	Phase II elCIC FDD: absolute and relative RSRP	11.1.0
	00	1		-	accuracies in non-MBSFN ABS	
2012-06	RP-56	RP-120784	1243	1	Phase II elCIC TDD: absolute and relative RSRP	11.1.0
		DD 100001	1010		accuracies in non-MBSFN ABS	
2012-06	RP-56 RP-56	RP-120784 RP-120779	1249 1251		RLM requirements with autonomous gaps for DRX CR for 36.133: Aligning RSRQ measurement	11.1.0
2012-06	KP-30	RP-120779	1251		requirements in TS 36.133 with TS 36.101 regarding	11.1.0
					the modification of B41 REFSENS	
2012-06	RP-56	RP-120777	1260		Bands 22, 23, 42 and 43 side conditions for inter-	11.1.0
		1			frequency measurements with autonomous gaps	
2012-06	RP-56	RP-120772	1261	1	Clarification on UE Rx-Tx with elCIC	11.1.0
2012-06 2012-06	RP-56 RP-56	RP-120767 RP-120782	1271 1273	1	sr-ConfigIndex in TDD DRX test cases Remove [] from elCIC RSRP, RSRQ Es/lot side	11.1.0
2012-00	111-50	131 -120/02	1213		conditions	11.1.0
2012-06	RP-56	RP-120764	1277	1	RRM: Clarifications to the OCNG patterns	11.1.0
2012-06	RP-56	RP-120784	1279	2	Intra-Frequency FDD RSRQ Accuracy under Time	11.1.0
					Domain Measurement Resource Restriction with	
2012.06	DD 56	DD 120704	1206	1	MBSFN ABS	11 1 0
2012-06 2012-06	RP-56 RP-56	RP-120784 RP-120784	1286 1288	1	elCIC FDD out-of-sync RLM test case in MBSFN ABS elCIC TDD out-of-sync RLM test case in MBSFN ABS	11.1.0 11.1.0
2012-06	RP-56	RP-120781	1289	1	On UE behavior in the uplink subframe after	11.1.0
_0 00	00	1		1	measurement GAP	
2012-06	RP-56	RP-120773	1293	1	Clarification on the number of monitoring layers for CA	11.1.0
0040 5 5	DE	DD 100=5	100-		UEs TERROPOLITA	4
2012-06	RP-56	RP-120784	1299	2	CR on TDD RSRQ test case under Time Domain Measurement Resource Restriction with MBSFN ABS	11.1.0
					Rel11	
		RP-120784	1303	1	In-Sync RLM test case in MBSFN ABS for E-UTRAN	11.1.0

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2012-06	RP-56	RP-120784	1306	1	FDD R11 In-Sync RLM test case in MBSFN ABS for E-UTRAN TDD R11	11.1.0
2012-06	RP-56	RP-120781	1310		Inter-frequency and Inter-RAT Requirements for Measurements without Measurement Gaps	11.1.0
2012-06	RP-56	RP-120788	1318	1	The introduction of Multi-TA timing requirements R11	11.1.0
2012-06	RP-56	RP-120777	1320	1	Addition of E-UTRAN FDD RSTD measurement accuracy test case in carrier aggregation R11	11.1.0
2012-06	RP-56	RP-120777	1322		Addition of E-UTRAN TDD RSTD measurement accuracy test case in carrier aggregation R11	11.1.0
2012-06	RP-56	RP-120779	1328		Correction to RLM requirements in elCIC with Autonomous gaps R11	11.1.0
2012-06	RP-56	RP-120769	1331	1	Correction to E-UTRAN FDD/TDD - UTRAN FDD /TDD enhanced cell identification test case R11	11.1.0
2012-06	RP-56	RP-120770	1336		Correction to E-UTRAN TDD redirection to UTRAN FDD test configuration R11	11.1.0
2012-06	RP-56	RP-120780	1337	1	FDD CA RSTD Measurement Reporting Delay Test Case (Rel-11)	11.1.0
2012-06	RP-56	RP-120782	1338	1	TDD CA RSTD Measurement Reporting Delay Test Case (Rel-11)	11.1.0
2012-06	RP-56	RP-120779	1342		Correction to RSTD measurement reporting delay requirement in CA R11	11.1.0
2012-06	RP-56	RP-120795	1345	1	Add Band 25 lo values R11	11.1.0
2012-06	RP-56	RP-120777	1347	1	Clarification for cell identification condition in inter-RAT SI reading requirement R11	11.1.0
2012-06	RP-56	RP-120793	1349	L	Introduction of Band 28	11.1.0
2012-06	RP-56	RP-120794	1350	1	Introduction of Band 44	11.1.0
2012-06	RP-56	RP-120780	1355		Editorial corrections	11.1.0
2012-06	RP-56	RP-120766	1361	2	Correction of a timer period in inter-frequency measurement tests	11.1.0
2012-06	RP-56	RP-120764	1363	1 2	UL Transmit Timing Requirements	11.1.0 11.1.0
2012-06	RP-56	RP-120784	1364		Phase Ilbis eICIC FDD absolute and relative RSRP accuracy with MBSFN ABS	
2012-06	RP-56	RP-120784	1366	2	Phase Ilbis eICIC TDD absolute and relative RSRP accuracy with MBSFN ABS	11.1.0
2012-06 2012-06	RP-56 RP-56	RP-120784 RP-120792	1368 1379	+	OCNG correction in Phase I elCIC test cases Introduction of e850_LB (Band 27) to TS 36.133	11.1.0 11.1.0
2012-00	RP-57	RP-121301	1385		Identification of Cell 3 in RRM Test cases A.4.2.7 and	11.2.0
2012-09	RP-57	RP-121301	1390		A.4.2.8 Making FDD-TDD Inter-freq RSRQ measurement	11.2.0
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09-2013	RP-61	RP-131303	1947			E-UTRAN FDD Intra-frequency handover test for 5MHz Channel Bandwidth	12.1.0
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09-2013	RP-61	RP-131293	1955			Clarification of CGI reading requirements	12.1.0
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09-2013	RP-61	RP-131303	1973			Part II RRM tests: E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	12.1.0
09-2013	RP-61	RP-131284	1978			Correction of cell identification test case with FelCIC	12.1.0
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09-2013	RP-61	RP-131284	1988			Clarification on antenna ports in the measured and aggressor cells for UE Rx-Tx with FeICIC	12.1.0
09-2013	RP-61	RP-131290	1990			FelCIC FDD Test for In-sync With MBSFN ABS for Rel. 12	12.1.0
09-2013	RP-61	RP-131290	1992			FelCIC TDD Test for In-sync With MBSFN ABS for Rel. 12	12.1.0
09-2013	RP-61	RP-131303	1993			Correction of the SNR value of Out of sync RLM test for 5MHz	12.1.0
12-2013	RP-62	RP-131927	1996			Corrections to CA event triggered tests on deactivated SCell with PCell interruption in non-DRX (Rel-12)	12.2.0
12-2013	RP-62	RP-131928	2003		1	Corrections to CA Interruption Requirements	12.2.0
12-2013	RP-62	RP-131926	2009			CRS Es/lot for elCIC RSRP, RSRQ with MBSFN ABS Test Cases	12.2.0
12-2013	RP-62	RP-131941	2010			Correction to RSTD measurement accuracy side condition for Band 31	12.2.0
12-2013	RP-62	RP-131928	2013			Amendment on SCell Activation Delay Requirements for other activation actions	12.2.0
12-2013	RP-62	RP-131928	2016			Amendment on SCell Activation Delay Requirements in case no RS for measurement	12.2.0
12-2013	RP-62	RP-131936	2019			Correction to the SNR values for RLM tests with	12.2.0
12-2013	RP-62	RP-131936	2023			MBSFN ABS in FelCIC R12 Correction for the RSRP/RSRQ test cases in FelCIC	12.2.0
12-2013	RP-62	RP-131928	2031	1		R12 CR on PCell Interruptions For Inter-band CA During	12.2.0
12-2013	RP-62	RP-131939	2039			Measurements Introduction of E-UTRAN TDD WB-RSRQ test case	12.2.0
12-2013	RP-62	RP-131925	2044			R12 Correction of Proximity Indication Test Case	12.2.0
0 1 0				1	1		

					Not implemented as it is not based on the latest version of the spec	
12-2013	RP-62	RP-131939	2053		Clarifications for intra-band non-contiguous CA R12	12.2.0
12-2013	RP-62	RP-131939	2058		Inter-frequency WB-RSRQ FDD test case	12.2.0
12-2013	RP-62	RP-131928	2071		Clarification on Pcell Interruption shall not occur before SF n+5	12.2.0
12-2013	RP-62	RP-131925	2078		Correction in RSTD requirements	12.2.0
12-2013	RP-62	RP-131939	2080		Editorial corrections RRM	12.2.0
12-2013	RP-62	RP-131939	2084	1	Band simplification	12.2.0
12-2013	RP-62	RP-131931	2091		Requirements clarification under different BWs in FelCIC	12.2.0
12-2013	RP-62	RP-131931	2095	<u> </u>	Correction in cell search FelCIC test cases	12.2.0
12-2013	RP-62	RP-131936	2097	1	Correct ABS pattern for FeICIC for In-sync with MBSFN ABS for Rel. 12	12.2.0
12-2013	RP-62	RP-131926	2104		Correction to Test cases A.9.2.9 and A.9.2.10	12.2.0
12-2013	RP-62	RP-131942	2106	1	Bands applicability in RSRP, RSRQ FDD-FDD Inter frequency tests for 5MHz Bandwidth	12.2.0
12-2013 12-2013	RP-62 RP-62	RP-131925 RP-131936	2111 2123		Corrections to CGI Reading in Autonomous Gap Remove the brackets of SNR values in RLM test cases	12.2.0 12.2.0
					in FelCIC R12	
12-2013	RP-62	RP-131967	2129		Correction on RMC pattern for 5MHz UE Transmit Timing Accuracy Tests	12.2.0
12-2013	RP-62	RP-131928	2135	+	CSI Reporting in SCell Activation Requirements	12.2.0
12-2013	RP-62	RP-131927	2143	+ +	Editorial corrections RRM	12.2.0
12-2013 12-2013	RP-62 RP-62	RP-131939 RP-131939	2145 2151	+ +	Applying band simplification Correction to MTA requirements	12.2.0 12.2.0
12-2013	RP-62	RP-131939	2155		Correction to MTA requirements Correction in RSTD test cases	12.2.0
12-2013	RP-62	RP-131931	2157		Correction to interference clarification in FelCIC requirements	12.2.0
03-2014	RP-63	RP-140389	2236		Band simplification clean up	12.3.0
03-2014	RP-63	RP-140368	2234		Missing condition in CGI identification requirements	12.3.0
03-2014	RP-63	RP-140368	2224		CSI Reporting in SCell Activation Requirements	12.3.0
03-2014	RP-63	RP-140368	2258		Alignment between interruption requirements for RSTD and mobillity measurements for SCell	12.3.0
03-2014	RP-63	RP-140367	2263		Correction of Proximity Indication Test Case	12.3.0
03-2014	RP-63	RP-140380	2259		Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth	12.3.0
03-2014	RP-63	RP-140380	2260		Addition of new RMC for E-UTRA TDD with 5MHz bandwidth	12.3.0
03-2014	RP-63	RP-140380	2261		Addition of OCNG pattern for E-UTRA FDD with 5MHz bandwidth without MBSFN	12.3.0
03-2014	RP-63	RP-140381	2169		Updates on test case A.9.1.17 FDD—FDD Inter frequency case for 5MHz Bandwidth for R12	12.3.0
03-2014	RP-63	RP-140389	2170		Correction on the SNR values of in-sync RLM test for 5MHz	12.3.0
03-2014	RP-63	RP-140371	2200	1	Clarification of BW applicability in Rx-Tx Time Difference measurement R12	12.3.0
03-2014	RP-63	RP-140389	2182		Clarification on FDD reference measurement channels for 5 MHz tests	12.3.0
03-2014	RP-63	RP-140368	2181		Correction on PDSCH allocation in PRS subframe r12	12.3.0
03-2014	RP-63	RP-140367	2192		PRS_RA corrections	12.3.0
06-2014	RP-64	RP-140650	2331	3	Introduction of test cases for 5MHz +5MHz : absolute and relative RSRQ accuracies in CA for FDD and TDD The CR was not implemented as it contained the wrong	12.4.0
06-2014	RP-64	RP-140743	2366	1	content. SCell activation and deactivation delay test case for known SCell	12.4.0
06-2014	RP-64	RP-140910	2312		Clarification on UE Transmit Timing Accuracy test cases in DRX mode R12	12.4.0
06-2014	RP-64	RP-140910	2267		RRM: Clean-up of time offset between cells in RSTD tests (Rel-12)	12.4.0
06-2014	RP-64	RP-140910	2354	+ +	RSTD inter-frequency requirements applicability	12.4.0
06-2014	RP-64	RP-140911	2382		RRM: Remove square brackets from eICIC RLM test requirement (Rel-12)	12.4.0
06-2014	RP-64	RP-140911	2379		Correction to periodicity of ABS pattern in elCIC RRM test cases	12.4.0
06-2014	RP-64	RP-140911	2315	1 1	Correction for OCNG pattern number in RRM tests R12	12.4.0
06-2014	RP-64	RP-140911	2302		Introduce the CGI reading requirements in CA R12	12.4.0
06-2014	RP-64	RP-140911	2360	1	Test case corrections for elCIC	12.4.0
06-2014	RP-64	RP-140911	2278		Removing DPCH for handover from E-UTRAN to UTRA TDD for Rel-12	12.4.0
06-2014	RP-64	RP-140911	2422		Clean up the correction on PDSCH allocation in PRS subframe R12	12.4.0

06-2014	RP-64	RP-140911	2319		Clarification on E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test R12	12.4.0
06-2014	RP-64	RP-140914	2416		Correction to PCI configuration conditions in FeICIC	12.4.0
06-2014	RP-64	RP-140914	2338		tests R12 CQI feedback periodicity correction for RLM in	12.4.0
06-2014	RP-64	RP-140916	2307		elCIC/FelCIC test setup E-UTRAN TDD - UE Timing Advance Adjustment	12.4.0
06-2014	RP-64	RP-140916	2340	1	Accuracy Test for Scell in sTAG Test case for RACH on SCell	12.4.0
06-2014	RP-64	RP-140916	2340	1	E-UTRAN FDD - UE Timing Advance Adjustment	12.4.0
					Accuracy Test for Scell in sTAG	
06-2014	RP-64	RP-140918	2357		Editorial corrections RRM	12.4.0
06-2014	RP-64	RP-140918	2364		Clean up for Band 29	12.4.0
06-2014	RP-64	RP-140918	2445		Removing square brackets in FeICIC test cases	12.4.0
06-2014	RP-64	RP-140923	2387		E-UTRAN FDD RSTD measurement reporting in carrier aggregation for 10MHz+5MHz	12.4.0
06-2014	RP-64	RP-140923	2388		E-UTRAN TDD RSTD measurement reporting in carrier aggregation for 10MHz+5MHz	12.4.0
06-2014	RP-64	RP-140923	2389		E-UTRAN FDD RSTD measurement accuracy in CA for 10MHz+5MHz	12.4.0
06-2014	RP-64	RP-140923	2390		E-UTRAN TDD RSTD measurement accuracy in CA for 10MHz+5MHz	12.4.0
06-2014	RP-64	RP-140923	2290		E-UTRAN FDD absolute and relative RSRP accuracies in CA for 10MHz+5MHz	12.4.0
06-2014	RP-64	RP-140923	2291		E-UTRAN TDD absolute and relative RSRP accuracies in CA for 10MHz+5MHz	12.4.0
06-2014	RP-64	RP-140926	2339		Introduction of Band 32/XXXII	12.4.0
06-2014	RP-64	RP-140928	2394	1	Introduce RRM measurement requirements for eIMTA	12.4.0
06-2014	RP-64	RP-140928	2396	1	Inter frequency measurements using autonomous gaps	12.4.0
06-2014	RP-64	RP-140930	2374	1	RRM requirements for TDD-FDD CA	12.4.0
06-2014	RP-64	RP-140937	2412	1	Introduction of test cases for 5MHz +5MHz : RSTD	12.4.0
					Measurement Accuracy in Carrier Aggregation for 5 + 5MHz bandwidth	
06-2014	RP-64	RP-140937	2330	1	Introduction of test cases for 5MHz +5MHz : absolute and relative RSRP accuracies in CA for FDD and TDD	12.4.0
06-2014	RP-64	RP-140937	2410	1	Introduction of test cases for 5MHz +5MHz : RSTD Measurement Reporting Test Case	12.4.0
06-2014	RP-64	RP-140937	2332	2	Introduction of test cases for 5MHz +5MHz : Event	12.4.0
					triggered reporting on deactivating Scells in non-DRX FDD and TDD	
06-2014	RP-64	RP-140937	2415	1	Introduction of test cases for 5MHz +5MHz : E-UTRA	12.4.0
					event triggered reporting on deactivated SCell with PCell interruption in non-DRX	
06-2014	RP-64	RP-140939	2294		E-UTRAN TDD absolute and relative RSRQ accuracies in CA for 10MHz+5MHz	12.4.0
06-2014	RP-64	RP-140939	2385		E-UTRAN FDD Event triggered reporting on	12.4.0
					deactivating Scells and interruption probability (0.5%) without DRX for 10MHz+5MHz	
06-2014	RP-64	RP-140939	2386		E-UTRAN TDD Event triggered reporting on	12.4.0
					deactivating Scells and interruption probability (0.5%) without DRX for 10MHz+5MHz	
06-2014	RP-64	RP-140939	2292		E-UTRAN FDD absolute and relative RSRQ accuracies	12.4.0
06.004.4	DD C4	DD 440000	2200		in CA for 5MHz+10MHz	10.4.0
06-2014	RP-64	RP-140939	2289		E-UTRAN TDD Event triggered reporting under deactivated Scell in non-DRX for 10MHz+5MHz	12.4.0
06-2014	RP-64	RP-140939	2288		E-UTRAN FDD Event triggered reporting under	12.4.0
06-2014	RP-64	RP-140945	2384		deactivated Scell in non-DRX for 10MHz+5MHz Correct Correlation Matrix and Antenna Configuration	12.4.0
				1	for RRM test cases A.8	
06-2014	RP-64	RP-140945	2346	1	E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	12.4.0
06-2014	RP-64	RP-140945	2383		Correct Correlation Matrix and Antenna Configuration for RRM test cases A.4, A.7	12.4.0
06-2014	RP-64	RP-140945	2336	2	New Test Case for UE Transmit Timing Accuracy requirements in DRX	12.4.0
06-2014	RP-64	RP-140945	2268	1	UE Behaviour after Measurement Gap	12.4.0
06-2014	RP-64	RP-140945	2345	1	E-UTRAN FDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	12.4.0
06-2014	RP-64	RP-140945	2419		Editorial correction for band 31 in 36.133	12.4.0
06-2014	RP-64	RP-140959	2395	2	Introduce RSRP/RSRQ measurement accuracy requirements for 3DL CA	12.4.0
06-2014	RP-64	RP-140959	2376	3	Introduce the support of 3DL CA to TS 36.133 Section 7.8 "Interruptions with Carrier Aggregation"	12.4.0
06-2014	RP-64	RP-140959	2375	2	Introduce the support of 3DL CA to TS 36.133 Section	12.4.0
						

				<u> </u>	7.1 "UE transmit timing"	
06-2014	RP-64	RP-140959	2373	2	SCell activation and deactivation delay requirements for 3 DL CA	12.4.0
09-2014	RP-65	RP-141526	2527		Tolerance levels for measurements on UTRAN	12.5.0
09-2014	RP-65	RP-141530	2474		Correction to periodicity of ABS pattern in felCIC RRM test cases	12.5.0
09-2014	RP-65	RP-141531	2515	1	Maximum transmission timing difference	12.5.0
09-2014	RP-65	RP-141536	2502		Introduction of test cases for 5MHz +5MHz : absolute and relative RSRQ accuracies in CA for FDD and TDD	12.5.0
09-2014	RP-65	RP-141539	2481		Modification on E-UTRAN event triggered reporting under deactivated SCell for 20 MHz bandwidth	12.5.0
09-2014	RP-65	RP-141545	2523	2	Introduction of BeaconRSSI measurements for WLAN/3GPP Radio Interworking	12.5.0
09-2014	RP-65	RP-141554	2492		Interruptions on Activated Serving Cells for 3DL CA	12.5.0
09-2014	RP-65	RP-141554	2495		Requirements for UE Measurements Procedures in	12.5.0
					RRC_CONNECTED State for 3DL CA	
09-2014	RP-65	RP-141562	2454	1	Correction of values in RSTD tests	12.5.0
09-2014	RP-65	RP-141562	2457	1.	Clarification to RSTD CA Reporting Delay tests	12.5.0
09-2014	RP-65	RP-141562	2480	1	Clarification on UE bahavior considering max transmit timing difference between TAGs R12	12.5.0
09-2014	RP-65	RP-141562	2496	1	Applicability of requirements	12.5.0
09-2014	RP-65	RP-141562	2510		Note to clarify that certain requirements do not apply to band 32	12.5.0
09-2014	RP-65	RP-141700	2471	3	Clarification for ACK/NACK feedback of CGI measurement	12.5.0
12-2014	RP-66	RP-142176	2484	2	Introducing measurement accuracy requirements for UE category 0 in TS36.133 Clause 9	12.6.0
12-2014	RP-66	RP-142176	2506	3	Measurements requirements for UE category 0 with 1 Rx	12.6.0
12-2014	RP-66	RP-142143	2534	-	Correction of PRS Signal Levels in RSTD Reporting Tests	12.6.0
12-2014	RP-66	RP-142144	2538	-	Correction of Es/Noc values in inter-frequency RSTD tests	12.6.0
12-2014	RP-66	RP-142174	2547	1	Introduction of PDSCH FRC for TDD UL-DL configuration 0	12.6.0
12-2014	RP-66	RP-142144	2553	1	Clarification on time to identify the target UTRA TDD cell for blind redirection from E-UTRA to UTRA TDD	12.6.0
12-2014	RP-66	RP-142174	2555	1	CR on inter frequency RSRP test case for eIMTA	12.6.0
12-2014	RP-66	RP-142174	2556	1	CR on inter frequency RSRQ test case for eIMTA	12.6.0
12-2014	RP-66	RP-142147	2566	-	Correction to ABS pattern and CRS Es/lot in felClC RRM test cases	12.6.0
12-2014	RP-66	RP-142144	2569	-	SCell activation and deactivation delay test case for unknown SCell R12	12.6.0
12-2014 12-2014	RP-66 RP-66	RP-142157 RP-142177	2573 2585	1	Clarification on cell identification for TDD config 0 RSRQ accuracy test case in TDD-FDD CA when Pcell is FDD R12	12.6.0 12.6.0
12-2014	RP-66	RP-142177	2586	1	RSRQ accuracy test case in TDD-FDD CA when Pcell is TDD R12	12.6.0
12-2014	RP-66	RP-142147	2597	-	Correction on Io value in CA 20MHz RSRQ test case R12	12.6.0
12-2014	RP-66	RP-142163	2598	-	Correction on Io value in CA 10MHz+5MHz RSRQ test case R12	12.6.0
12-2014	RP-66	RP-142188	2599	-	Range increase for RSRQ	12.6.0
12-2014	RP-66	RP-142188	2606	1	Clarification of parallel reporting criteria (E-UTRA)	12.6.0
12-2014	RP-66	RP-142164	2611	1	Interruptions with RSTD Measurements for 3DL CA	12.6.0
12-2014	RP-66	RP-142164	2614	-	RRM requirements for RSTD in 3 DL CA	12.6.0
12-2014	RP-66	RP-142177	2619	1	RSRP accuracy test cases for TDD-FDD CA	12.6.0
12-2014	RP-66	RP-142176	2630	-	SI reading requirements for UE category 0 with 1 Rx in FDD, TDD and HD-FDD	12.6.0
12-2014	RP-66	RP-142144	2639	-	Changes to RSTD CA Reporting Delay tests	12.6.0
12-2014	RP-66	RP-142188	2640	-	Revision of RSRP absolute accuracy requirements in Rel-12	12.6.0
12-2014	RP-66	RP-142144	2644	-	Clarifications to RSTD values	12.6.0
12-2014 12-2014	RP-66 RP-66	RP-142144 RP-142144	2656 2665	-	Correction to RSTD Intra Frequency Delay Test Case Correction on autonomous time adjustment in MTAG	12.6.0 12.6.0
40.0044	DD 66	DD 440476	0000	1	case	40.00
12-2014 12-2014	RP-66 RP-66	RP-142176 RP-142174	2666 2669	1	Introduce RLM requirements for LC-MTC in TS36.133 Introducing test case for TDD-TDD Inter-frequency	12.6.0 12.6.0
			L	↓	event triggered reporting for TDD UL/DL configuration 0	40.00
12-2014	RP-66	RP-142179	2670	1	Introducing requirements for small cell enhancement in TS36.133	12.6.0

12-2014	RP-66	RP-142162	2674	-	E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz	12.6.0
12-2014	RP-66	RP-142162	2675	-	E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 20MHz+10MHz	12.6.0
12-2014	RP-66	RP-142162	2676	-	E-UTRAN TDD RSTD Measurement Reporting Test	12.6.0
12-2014	RP-66	RP-142162	2677	-	Case for 20MHz+10MHz TDD RSRP for E-UTRAN Carrier Aggregation for	12.6.0
12-2014	RP-66	RP-142162	2678	1	20MHz+10MHz TDD RSRP for E-UTRAN Carrier Aggregation for	12.6.0
12-2014	RP-66	RP-142162	2679	-	20MHz+10MHz E-UTRAN TDD RSTD Measurement Accuracy in	12.6.0
12-2014	RP-66	RP-142143	2682	1	Carrier Aggregation for 20MHz+10MHz Introducing positioning enhancement requirement for	12.6.0
40.0044	DD 00	DD 440444	0000		UE Rx-Tx accuracy	10.00
12-2014	RP-66	RP-142144 RP-142188	2686	-	Correction on CA test cases in R12	12.6.0 12.6.0
12-2014	RP-66		2687		Correction on E-UTRAN TDD – Non-Contention Based Random Access Test For Scell	
12-2014	RP-66	RP-142179	2688	1	Introduction of RSRP measurement accuracy requirement for DRS based measurement	12.6.0
12-2014	RP-66	RP-142188	2690	1	Ecat clarification for iRAT	12.6.0
12-2014	RP-66	RP-142180	2694	-	CR for TS36.133 on Cell phase accuracy for Dual Connectivity	12.6.0
12-2014	RP-66	RP-142180	2695	1	Introduction of RRM requirements for Dual Connectivity	12.6.0
12-2014	RP-66	RP-142180	2696	1	Introduction of measurement requirements for Dual Connectivity	12.6.0
12-2014	RP-66	RP-142178	2697	1	Measurement and reporting of BLER in section 9	12.6.0
12-2014	RP-66	RP-142177	2698	1	Introduction of TDD-FDD CA test cases	12.6.0
12-2014	RP-66	RP-142178	2699	1	CR on measurement for MBSFN MDT	12.6.0
12-2014	RP-66	RP-142188	2707	1	PCell Interruption in Rel-12 CA	12.6.0
12-2014	RP-66	RP-142158	2708	1	UE Behaviour after Measurement Gap in CA	12.6.0
12-2014	RP-66	RP-142177	2709	1	CA RRM Testing for Multiple Duplex Modes	12.6.0
12-2014 12-2014	RP-66 RP-66	RP-142177 RP-142188	2710 2712	1	CA RRM Testing for Fall back CA Configuration Introduction of High Doppler measurement accuracy	12.6.0 12.6.0
					requierments	
12-2014	RP-66	RP-142172	2714	1	Requirements for increased carrier monitoring for idle mode 36.133	12.6.0
12-2014	RP-66	RP-142172	2715	1	Requirements for increased carrier monitoring in RRC connected state 36.133	12.6.0
12-2014	RP-66	RP-142161	2716	1	Different TDD configurations in CA	12.6.0
12-2014	RP-66	RP-142178	2722	1	MBMS requirements in section 9	12.6.0
12-2014	RP-66	RP-142179	2725	1	Intra-frequency and inter-frequency measurement accuracy requirements with DMTC	12.6.0
12-2014	RP-66	RP-142188	2727	-	RSTD accuracy requirements for smaller and larger bandwidths	12.6.0
12-2014	RP-66	RP-142149	2736	-	Corrections to E-UTRAN TDD RLM In-sync under Time Domain Measurement Resource Restriction with CRS assistance information	12.6.0
12-2014	RP-66	RP-142149	2738	-	Corrections to E-UTRAN TDD RLM Out-of-sync under Time Domain Measurement Resource Restriction with	12.6.0
					CRS Assistance Information	
12-2014	RP-66	RP-142149	2740	-	Test case for inter-RAT HO to multicarrier UTRA	12.6.0
12-2014	RP-66	RP-142178	2741	-	CR on parallel reporting criteria for eMBMS	12.6.0
12-2014	RP-66	RP-142186	2742	-	Introduction of 2UL non-contiguous intra-band CA	12.6.0
12-2014	RP-66	RP-142021	2743	-	Introduction of 2UL inter-band CA	12.6.0
12-2014	RP-66	RP-142150	2745	-	Requirements for multicarrier handover from EUTRA to UTRA	12.6.0
03-2015	RP-77	RP-150387	2747	-	CR to Correct Implementation Error in FDD RSTD Measurement Reporting Delay Test Case and to Update Io Levels for Certain RSTD Test Cases	12.7.0
03-2015	RP-77	RP-150382	2750	-	Remove incorrect note from CA RSTD Accuracy tests	12.7.0
03-2015	RP-77	RP-150387	2751	-	Change Nprs value for 5MHz CA RSTD Accuracy tests	12.7.0
03-2015	RP-77	RP-150066	2754	1	Maximum allowed layers for multiple monitoring for CA	12.7.0
03-2015	RP-77	RP-150387	2756	-	DRX correction for interruption with dual connectivity	12.7.0
03-2015	RP-77	RP-150388	2757	-	Correction of Interruptions with RSTD Measurements for 3DL CA	12.7.0
03-2015	RP-77	RP-150387	2761	1	RRM requirements for ProSe	12.7.0
03-2015	RP-77	RP-150396	2763	1	Updating the requirements applicability for TDD config 0	12.7.0
03-2015	RP-77	RP-150394	2764	1	Cleanup for RSRQ measurement requirement for SCE	12.7.0
03-2015	RP-77	RP-150394	2774	1	Clean up the correction on discovery signal measurements	12.7.0
03-2015	RP-77	RP-150387	2775	1	Correction on MBSFN measurements	12.7.0
03-2015	RP-77	RP-150394	2776	-	Introduce CA measurement accuracy requirements for	12.7.0

00.0045	DD 77	DD 450000	0777		SCE	40.7.0
03-2015	RP-77	RP-150382	2777	-	Correction on Io in carrier aggregation test cases	12.7.0
03-2015 03-2015	RP-77 RP-77	RP-150387 RP-150384	2783 2785	-	Introducing accuracy requirement for new RSRQ Time-domain measurement resource restriction pattern	12.7.0 12.7.0
03 2013	IXI -77	100004	2700		for serving cell in felCIC RSRP and RSRQ test cases	12.7.0
03-2015	RP-77	RP-150384	2791	-	CR on typo of referencing section name in CA	12.7.0
00.0045	DD 77	DD 450000	0707	1	measurements	40.70
03-2015	RP-77	RP-150393 RP-150386	2797 2798	1	Clarification including PSCell in Note 1 for Ecat Clarification of IncMon requirements for E-UTRA idle	12.7.0 12.7.0
03-2013	KF-11	KF-150566	2190	'	state	12.7.0
03-2015	RP-77	RP-150386	2799	1	Clarification of IncMon requirements for E-UTRA connected state	12.7.0
03-2015	RP-77	RP-150386	2800	1	Clarification concerning IncMon scaling for non-gap- assisted measurements	12.7.0
03-2015	RP-77	RP-150382	2803	-	Correction of RMC and OCNG pattern in event triggered tests without measurement gap	12.7.0
03-2015	RP-77	RP-150394	2804	-	CR on RSRQ requirements for CRS based discovery signal	12.7.0
03-2015	RP-77	RP-150387	2808	-	Correction to RRM test cases	12.7.0
03-2015	RP-77	RP-150388	2809	-	Correction to CA Testing with Different CA Configurations	12.7.0
03-2015	RP-77	RP-150393	2811	-	Principle to test synchronous and asynchronous DC requirements	12.7.0
03-2015	RP-77	RP-150387	2814	-	Further revision of RSRP requirement for 36.133 release 12	12.7.0
03-2015	RP-77	RP-150387	2815	-	Additional bandwidths for EUTRAN activation and deactivation of known and unknown SCell in non-DRX	12.7.0
03-2015	RP-77	RP-150387	2816	1	High Doppler measurement accuracy requirements	12.7.0
03-2015	RP-77	RP-150384	2817	1	36.133 CR to change CPICH Ec/No to CPICH Ec/lo in	12.7.0
00 0045	DD 77	DD 450000	2022		EUTRA FDD to UTRA FDD HO test cases	40.7.0
03-2015 03-2015	RP-77 RP-77	RP-150388 RP-150053	2822 2824	-	Maximum Transmission Timing Difference in 3DL CA Correction to the implementation of CR 2471r3	12.7.0 12.7.0
03-2013	KF-11	KF-130033	2024	_	(Clarification for ACK/NACK feedback of CGI measurement)	12.7.0
06-2015	RP-68	RP-150972	2825		3 DL CA Phase I tests # 1-2: Event triggered reporting tests with deactivated SCells in non-DRX for TDD-FDD CA	12.8.0
06-2015	RP-68	RP-150961	2828		RMC for 10 MHz for UE category 0 RRM tests	12.8.0
06-2015	RP-68	RP-150957	2829		Correction to measurement scaling factor for incmon	12.8.0
06-2015	RP-68	RP-150957	2832		RSRP requierment for SCE	12.8.0
06-2015	RP-68	RP-150962	2833r 1	1	CR on FDD-FDD inter-frequency absolute and relative CRS RSRP accuracy test case	12.8.0
06-2015	RP-68	RP-150962	2834r 1	1	CR on TDD-TDD inter-frequency absolute and relative CRS RSRP accuracy test case	12.8.0
06-2015	RP-68	RP-150962	2835r 1	1	CR on FDD absolute and relative CSI-RSRP accuracy test case for E-UTRAN Carrier Aggregation	12.8.0
06-2015	RP-68	RP-150962	2836r 1	1	CR on TDD absolute and relative CSI-RSRP accuracy test case for E-UTRAN Carrier Aggregation	12.8.0
06-2015	RP-68	RP-150962	2837r 1	1	CR on FDD-FDD inter-frequency absolute and relative CSI-RSRP accuracy test case	12.8.0
06-2015	RP-68	RP-150962	2838r 1	1	CR on TDD-TDD inter-frequency absolute and relative CSI-RSRP accuracy test case	12.8.0
06-2015	RP-68	RP-150962	2839r 1	1	CR on FDD intra frequency absolute and relative CSI- RSRP accuracy test case	12.8.0
06-2015	RP-68	RP-150962	2840r 1	1	CR on TDD intra frequency absolute and relative CSI-RSRP accuracy test case	12.8.0
06-2015	RP-68	RP-150962	2842r 1	1	Intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	12.8.0
06-2015	RP-68	RP-150962	2843r 1	1	Absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	12.8.0
06-2015	RP-68	RP-150962	2845r 1	1	SCE FDD intra-frequency absolute RSRQ accuracy	12.8.0
06-2015	RP-68	RP-150962	2846r 1	1	SCE TDD intra-frequency absolute RSRQ accuracy	12.8.0
06-2015 06-2015	RP-68 RP-68	RP-150962 RP-150962	2847 2848		SCE FDD absolute RSRQ accuracy for CA SCE TDD absolute RSRQ accuracy for CA	12.8.0 12.8.0
06-2015	RP-68	RP-150962 RP-150961	2848 2849r	1	Test for CGI acquisition requirements for UE category 0	12.8.0
06-2015	RP-68	RP-150961	1 2850r	1	Test for cell identification for UE category 0	12.8.0
55 2010	00	1 100001	1	'	1 Section Seal Additional for SE Satisfary 6	. 2.0.0
06-2015	RP-68	RP-150961	2851		Test for handover requirements for UE category 0	12.8.0
06-2015	RP-68	RP-150961	2852		Test for RRC re-establishment requirements for UE category 0	12.8.0
	RP-68	RP-150961	2853r	1	HD-FDD handover requirements for UE category 0	12.8.0

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06-2015	RP-68	RP-150957	2855r 1	1	Correction of requirements for ProSe in DRX	12.8.0
06-2015	RP-68	RP-150962	2857r 1	1	E-UTRAN FDD intra frequency CRS based discovery signal measurements when DRX is used	12.8.0
06-2015	RP-68	RP-150962	2858r 1	1	E-UTRAN TDD intra frequency CRS based discovery signal measurements when DRX is used	12.8.0
06-2015	RP-68	RP-150962	2859r	1	E-UTRAN FDD-FDD inter-frequency event triggered	12.8.0
			1		reporting under fading propagation conditions in DRX based on CRS based discovery signal	
06-2015	RP-68	RP-150962	2860r 1	1	E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX	12.8.0
06-2015	RP-68	RP-150962	2861r 1	1	based on CRS based discovery signal E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based	12.8.0
06-2015	RP-68	RP-150962	2862r	1	discovery signal E-UTRAN TDD event triggered reporting under	12.8.0
			1		deactivated SCell in non-DRX based on CRS based discovery signal	
06-2015	RP-68	RP-150961	2866r 1	1	RSRP accuracy FD-FDD Intra frequency case for UE category 0	12.8.0
06-2015	RP-68	RP-150961	2867r 1	1	RSRP accuracy HD-FDD Intra frequency case for UE category 0	12.8.0
06-2015	RP-68	RP-150961	2868r 1	1	RSRP accuracy TDD Intra frequency case for UE category 0	12.8.0
06-2015	RP-68	RP-150961	2869r 1	1	RSRQ accuracy FD-FDD Intra frequency case for UE category 0	12.8.0
06-2015	RP-68	RP-150961	2870r 1	1	RSRQ accuracy HD-FDD Intra frequency case for UE category 0	12.8.0
06-2015	RP-68	RP-150961	2871r 1	1	RSRQ accuracy TDD Intra frequency case for UE category 0	12.8.0
06-2015	RP-68	RP-150972	2872r 1	1	Test case for 3DL CA: PCell in FDD: Event triggered reporting on deactivated SCells and interruption	12.8.0
06-2015	RP-68	RP-150972	2873r 1	1	probability (0.5%) without DRX (TDD-FDD CA) Test case for 3DL CA: PCell in TDD: Event triggered reporting on deactivated SCells and interruption probability (0.5%) without DRX (TDD-FDD CA)	12.8.0
06-2015	RP-68	RP-150958	2874r 1	1	Test case for 3DL CA: Event triggered reporting on deactivated SCells and interruption probability (0.5%) without DRX (FDD CA)	12.8.0
06-2015	RP-68	RP-150968	2875r 1	1	Test case for 3DL CA: Event triggered reporting on deactivated SCells and interruption probability (0.5%) without DRX (TDD 3 DL CA)	12.8.0
06-2015	RP-68	RP-150965	2880		OTDOA RSTD Measurements on different secondary component carriers	12.8.0
06-2015	RP-68	RP-150955	2884		E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth R12	12.8.0
06-2015	RP-68	RP-150958	2885		E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth R12	12.8.0
06-2015	RP-68	RP-150955	2886		E-UTRAN TDD with 20 MHz +20 MHz bandwidth to UTRAN TDD cell search under fading propagation	12.8.0
06-2015	RP-68	RP-150958	2887		conditions R12 E-UTRAN TDD with 20 MHz +10 MHz bandwidth to UTRAN TDD cell search under fading propagation	12.8.0
06-2015	RP-68	RP-150957	2897		conditions R12 Further clarification of MBMSBLER reporting in section	12.8.0
06-2015	RP-68	RP-150962	2903r	1	9 Test case of FDD-FDD inter-frequency RSRQ	12.8.0
06-2015	RP-68	RP-150962	2904		measurement accuracy in discovery signal occasions CR on side conditions for inter-frequency measurement	12.8.0
06-2015	RP-68	RP-150962	2905		for SCE CR on test case for RSRQ TDD-TDD inter frequency	12.8.0
06-2015	RP-68	RP-150955	2906r	1	measurement accuracy requirement for SCE Maximum Rx difference between Pcell and Scell in	12.8.0
06-2015	RP-68	RP-150962	2908r	1	section 7.9 FDD-FDD intra frequency event triggered reporting in DRX based on CSI-RS based discovery signal	12.8.0
06-2015	RP-68	RP-150962	2909r	1	TDD-TDD intra frequency event triggered reporting in DRX based on CSI-RS based discovery signal	12.8.0
06-2015	RP-68	RP-150962	2910r	1	FDD-FDD inter frequency event triggered reporting in DRX based on CSI-RS based discovery signal	12.8.0
06-2015	RP-68	RP-150962	2911r	1	TDD-TDD inter frequency event triggered reporting in DRX based on CSI-RS based discovery signal	12.8.0

06-2015	RP-68	RP-150962	2912r 1	1	FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	12.8.0
06-2015	RP-68	RP-150962	2913r 1	1	TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	12.8.0
06-2015	RP-68	RP-150957	2915r 2	2	CR of DC interruption requirements	12.8.0
06-2015	RP-68	RP-150965	2916r 1	1	Event triggered reporting on deactivated SCells in non- DRX (FDD CA)	12.8.0
06-2015	RP-68	RP-150965	2917r	1	Event triggered reporting on deactivated SCells in non- DRX (TDD CA)	12.8.0
06-2015	RP-68	RP-150972	2919r 1	1	Introduction of RRM test case for E-UTRAN TDD-FDD 3 DL CA activation and deactivation of known SCell in	12.8.0
06-2015	RP-68	RP-150972	2920r	1	non-DRX with PCell in FDD Introduction of RRM test case for E-UTRAN TDD-FDD	12.8.0
			1		3 DL CA activation and deactivation of known SCell in non-DRX with PCell in TDD	
06-2015	RP-68	RP-150972	2921		3DL CA Phase I tests #11_3DL FDD CA SCell activation and deactivation for known SCells without DRX	12.8.0
06-2015	RP-68	RP-150965	2921a		Correction of implementation of CR 2644 in Table A.9.8.1.1-1	12.8.0
06-2015	RP-68	RP-150972	2922		3DL CA Phase I tests #12_3DL TDD CA SCell activation and deactivation for known SCells without DRX	12.8.0
06-2015	RP-68	RP-150959	2922a r2	2	Incmon CR for FDD-FDD Interfrequency correct reporting of measurement events without reduced performance group configured, non DRX	12.8.0
06-2015	RP-68	RP-150959	2923r 2	2	Incmon CR for TDD-TDD Interfrequency correct reporting of measurement events without reduced performance group configured, non DRX	12.8.0
06-2015	RP-68	RP-150963	2928r	1	FDD RLM Test Case for Out-of-sync in DRX for PSCell in asynchronous DC	12.8.0
06-2015	RP-68	RP-150963	2929r	1	FDD RLM Test Case for In-sync in DRX for PSCell in asynchronous DC	12.8.0
06-2015	RP-68	RP-150954	2932		Correction of Cell Time offset in RSTD CA Test cases (Rel-12)	12.8.0
06-2015	RP-68	RP-150963	2933r 1	1	Introduction of DC intra-frequency event triggered reporting with DRX in synchronous FDD DC	12.8.0
06-2015	RP-68	RP-150963	2934r 1	1	Introduction of DC intra-frequency event triggered reporting with DRX in synchronous TDD DC	12.8.0
06-2015	RP-68	RP-150963	2935r 1	1	Introduction of DC intra-frequency event triggered reporting with DRX in asynchronous FDD DC	12.8.0
06-2015	RP-68	RP-150963	2936r 1	1	Introduction of DC inter-frequency event triggered reporting with DRX in synchronous FDD DC	12.8.0
06-2015	RP-68	RP-150963	2937r 1	1	Introduction of DC inter-frequency event triggered reporting with DRX in synchronous TDD DC	12.8.0
06-2015	RP-68	RP-150959	2938r	1	Testcases for E-UTRA Incmon idle interfrequency reselection	12.8.0
06-2015	RP-68	RP-150962	2940r 2	2	CR on minimum number of subframes for discovery- based measurements	12.8.0
06-2015	RP-68	RP-150961	2941r	1	E-UTRAN FD-FDD Radio Link Monitoring Tests for UE category 0	12.8.0
06-2015	RP-68	RP-150961	2942r	1	E-UTRAN HD-FDD Radio Link Monitoring Tests for UE category 0	12.8.0
06-2015	RP-68	RP-150961	2943r	1	E-UTRAN TDD Radio Link Monitoring Tests for UE category 0	12.8.0
06-2015	RP-68	RP-150958	2944r	1	Absolute and relative RSRP accuracies in FDD 3 DL CA	12.8.0
06-2015	RP-68	RP-150968	2945r	1	Absolute and relative RSRP accuracies in TDD 3 DL CA	12.8.0
06-2015	RP-68	RP-150972	2946r	1	PCell in FDD: absolute and relative RSRQ accuracies in TDD-FDD 3 DL CA	12.8.0
06-2015	RP-68	RP-150972	2947r	1	PCell in TDD: absolute and relative RSRQ accuracies in TDD-FDD 3 DL CA	12.8.0
06-2015	RP-68	RP-150959	2950		FDD-FDD Interfrequency correct reporting of measurement events with reduced performance group configured for non DRX IncMon	12.8.0
06-2015	RP-68	RP-150959	2951		TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group	12.8.0
06-2015	RP-68	RP-150963	2952r	1	configured for non DRX IncMon E-UTRAN FDD Radio Link Monitoring Test for In-sync	12.8.0
	RP-68	RP-150963	1 2953r	1	in DRX for PSCell in synchronous dual connectivity E-UTRAN TDD Radio Link Monitoring Test for In-sync	12.8.0

06-2015	RP-68	RP-150961	2954r 1	1	E-UTRAN FDD PCell interruption at transitions between active and non-active when DRX is used in PSCell in	12.8.0
06-2015	RP-68	RP-150958	2955		asynchronous dual connectivity E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth R12	12.8.0
06-2015	RP-68	RP-150955	2956		E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG for 20 MHz +20 MHz bandwidth R12	12.8.0
06-2015	RP-68	RP-150958	2957		E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG for 20 MHz +10 MHz bandwidth R12	12.8.0
06-2015	RP-68	RP-150955	2958		E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test for Scell in sTAG for 20 MHz +20 MHz bandwidth R12	12.8.0
06-2015	RP-68	RP-150958	2959		E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test for Scell in sTAG for 20 MHz +10 MHz bandwidth R12	12.8.0
06-2015	RP-68	RP-150965	2962		Addition PDSCH RMC for 5MHz with user data	12.8.0
06-2015	RP-68	RP-150972	2967r 1	1	3 DL CA Phase II tests # 1-2: RSRP measurement accuracies for TDD-FDD CA	12.8.0
06-2015	RP-68	RP-150963	2971r 1	1	PSCell Add and Release Delay Tests for Synchronous DC	12.8.0
06-2015	RP-68	RP-150963	2972r 1	1	PSCell Add and Release Delay Tests for Asynchronous DC	12.8.0
06-2015	RP-68	RP-150959	2975r 1	1	Idle mode FDD to UTRA FDD interRAT reselection	12.8.0
06-2015	RP-68	RP-150959	2976r	1	Idle mode TDD to UTRA FDD interRAT reselection	12.8.0
06-2015	RP-68	RP-150959	2977		E-UTRA FDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group	12.8.0
06-2015	RP-68	RP-150959	2978		configured, non DRX E-UTRA TDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group configured, non DRX	12.8.0
06-2015	RP-68	RP-150963	2979r 1	1	E-UTRAN FDD PCell interruption at transitions between active and non-active when DRX is used in PSCell in synchronous dual connectivity	12.8.0
06-2015	RP-68	RP-150963	2980r 1	1	E-UTRAN TDD PCell interruption at transitions between active and non-active when DRX is used in PSCell in synchronous dual connectivity	12.8.0
06-2015	RP-68	RP-150963	2981r 1	1	E-UTRAN FDD inter-frequency event triggered reporting in asynchronous dual connectivity	12.8.0
06-2015	RP-68	RP-150958	2984r 1	1	Modification for interruption period for SCell (de-)activation with 3DL	12.8.0
06-2015	RP-68	RP-150959	2987r 1	1	Test cases of Idle mode E-UTRA to UTRA TDD interRAT cell reselection for IncMon	12.8.0
06-2015	RP-68	RP-150959	2988r 1	1	Test cases of Interfrequency correct reporting of measurement events with reduced performance group configured, DRX	12.8.0
06-2015	RP-68	RP-150963	2989r 2	2	E-UTRAN FDD Radio Link Monitoring Test for Out-of- sync in DRX for PSCell in synchronous dual connectivity	12.8.0
06-2015	RP-68	RP-150963	2990r 2	2	E-UTRAN TDD Radio Link Monitoring Test for Out-of- sync in DRX for PSCell in synchronous dual connectivity	12.8.0
06-2015	RP-68	RP-150957	2992		CR on interruption during D2D discovery for D2D single RF chain	12.8.0
06-2015	RP-68	RP-150965	2993		CR on E-UTRAN TDD-TDD inter frequency measurements when DRX is used	12.8.0
06-2015	RP-68	RP-150965	2998		Test case of FDD-FDD inter-frequency new RSRQ measurement accuracy	12.8.0
06-2015	RP-68	RP-150965	2999		Test case of TDD-TDD inter-frequency new RSRQ measurement accuracy	12.8.0
06-2015	RP-68	RP-150955	3001	† †	Correction to felCIC cell configurations in RLM	12.8.0
06-2015	RP-68	RP-150955	3003	† †	Correction to A.8.1.8	12.8.0
06-2015	RP-68	RP-150972	3004r 1	1	CR on absolute and relative RSRQ accuracies in TDD 3DL CA	12.8.0
06-2015	RP-68	RP-150972	3005r 1	1	CR on absolute and relative RSRQ accuracies in FDD 3DL CA	12.8.0
06-2015	RP-68	RP-150965	3006		CR for test case of new RSRQ measurement accuracy in FDD	12.8.0
06-2015	RP-68	RP-150965	3007		CR for test case of new RSRQ measurement accuracy in TDD	12.8.0
06-2015	RP-68	RP-150972	3008r 1	1	RSTD measurement reporting in FDD 3 DL CA	12.8.0
06-2015	RP-68	RP-150972	3009r	1	RSTD measurement reporting in TDD 3 DL CA	12.8.0

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06-2015	RP-68	RP-150972	3010r	1		RSTD measurement accuracy in FDD 3 DL CA	12.8.0
06-2015	RP-68	RP-150972	3011r	1		RSTD measurement accuracy in TDD 3 DL CA	12.8.0
06-2015	RP-68	RP-150964	3012r	2		Clarification of ProSe requirements in ONC	12.8.0
06-2015	RP-68	RP-150957	3013			Correction to Asynchronous Requirements for DC for only FDD-FDD	12.8.0
06-2015	RP-68	RP-150959	3014			E-ÚTRA TDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group	12.8.0
00.0015		55 /				configured non DRX IncMon	
06-2015	RP-68	RP-150959	3015			E-UTRA FDD InterRAT UTRA TDD correct reporting of measurement events with reduced performance group configured non DRX for IncMon	12.8.0
06-2015	RP-68	RP-150958	3016			Correction to E-UTRA TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz + 10 MHz	12.8.0
06-2015	RP-68	RP-150969	2893		1	Carrier aggragation test cases for band 31	13.0.0
06-2015	RP-68	RP-150974	2966			4DL CA RRM requirements for "UE Measurements Procedures in RRC_CONNECTED State"	13.0.0
06-2015	RP-68	RP-150974	2970	1		RRM Requirements in Section 7 for 4 DL CA	13.0.0
09-2015	RP-69	RP-151475	3020	-		Correction of lor/loc value in RRM Test case A.4.3.1.1	13.1.0
09-2015	RP-69	RP-151479	3022	-		Cleanup of 3DL CA RRM Test cases	13.1.0
09-2015	RP-69	RP-151483	3031	-		Time offset between cells	13.1.0
09-2015	RP-69	RP-151497	3032	-		Requirements for DC on ACK/NACK reporting for measurements using autonomous gaps	13.1.0
09-2015	RP-69	RP-151475	3034	-		Interruptions at overlapping addition/release/activation/deactivation of SCells	13.1.0
09-2015	RP-69	RP-151504	3035	-		RRM Requirements for 3 DL/2UL Inter-band CA	13.1.0
09-2015	RP-69	RP-151483	3037	-		CR on editorial corrections in TS36133 in Rel-13	13.1.0
09-2015	RP-69	RP-151478	3039	-		CR on item title of table in clause 8.1.2.4.5.1 in TS36133 in Rel-13	13.1.0
09-2015	RP-69	RP-151500	3041	-		3DL CA Phase II tests #15_ SCell activation and deactivation for unknown SCells without DRX (FDD 3 DL CA) in Rel-13	13.1.0
09-2015	RP-69	RP-151500	3043	-		3DL CA Phase II tests #16_SCell activation and deactivation for unknown SCells without DRX (TDD 3 DL CA) in Rel-13	13.1.0
09-2015	RP-69	RP-151475	3045	-		Modifying test case of E-UTRAN 2DL TDD CA activation of unknown SCell in non-DRX in Rel-13	13.1.0
09-2015	RP-69	RP-151480	3047	-		CR on delete note in table 8.5.2.1.6.1-1 in TS36133 in Rel-13	13.1.0
09-2015	RP-69	RP-151479	3052	-		Correction of inconsistency in 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX	13.1.0
09-2015	RP-69	RP-151479	3054	-		CR on Interruptions at PSCell Addition/release	13.1.0
09-2015	RP-69	RP-151483	3062	-		Corrections to the RMC configurations in 36.133 R13	13.1.0
09-2015	RP-69	RP-151479	3064	-		Remove the Brackets in RLM Tests for UE category 0 R13	13.1.0
09-2015	RP-69	RP-151474	3066	1		Adding SNR values to DC RLM test cases R13	13.1.0
09-2015	RP-69	RP-151486	3068	-		Correction on Band 31 test cases R13	13.1.0
09-2015	RP-69	RP-151483	3070	-		Correction to UE transmit timing accuracy tests R13	13.1.0
09-2015	RP-69	RP-151500	3078	i		Introduction of RRM test case for E-UTRAN TDD-FDD 3DL CA activation and deactivation of unknown SCell in non-DRX with PCell in TDD	13.1.0
09-2015	RP-69	RP-151483	3079	-		Modifying test case of E-UTRAN 2DL FDD CA activation of unknown SCell in non-DRX	13.1.0
09-2015	RP-69	RP-151500	3080	-		Introduction of RRM test case for E-UTRAN TDD-FDD 3DL CA activation and deactivation of unknown SCell in non-DRX with PCell in FDD	13.1.0
12-2015	RP-70	RP-152131	3086	-		Correction of RSRQ value in RRM Serving Cell Test cases A.9.9.1, A.9.9.2	13.2.0
12-2015	RP-70	RP-152136	3088	-		Remove brackets in RSTD measurement accuracy R13	13.2.0
12-2015	RP-70	RP-152133	3090	-		Remove bracket for CSI-RSRP measurement R13	13.2.0
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12-2015	RP-70	RP-152133	3096	-		Correction to E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD R13	13.2.0
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History

	Document history								
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