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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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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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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 |
| | [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] |

| [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 36.300 [25].

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

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

Extended DRX: extended DRX cycles are as specified in TS 24.008 [34].

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 36.300 [25].

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 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

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 36.300 [25].

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 36.300 [25].

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

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

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 0 applicability: In this version of this specification the requirements for a UE category 0 are derived assuming UE category 0 [31] and a single antenna receiver.

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 bracket must be considered for further studies, because it means that a

decision about that value was not taken.

BW_{Channel} Channel bandwidth, defined in TS 36.101 subclause 3.2

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.

In 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_{PRB} 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_{CMAX} 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

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

T_{RE-ESTABLISH-REO} 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.

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

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

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 Extended 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 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 Signal PSSCH Physical Sidelink Shared CHannel

psTAG Primary Secondary Timing Advance Group

pTAG Primary Timing Advance Group 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.

Table 3.5.1-1: E-UTRA band groups

| Group | | E-UTRA FDD | E-UTRA TDD | | RA TDD E-UTRA Frame Structu | |
|-------|---------------------------|---|---------------------|---------------------------------------|-----------------------------|-----------------|
| | Band group notation | Operating bands | Band group notation | Operating bands | Band group notation | Operating bands |
| Α | FDD_A | 1, 4, 6, 10, 11, 18, 19, 21, 23, 24, 32 Note 4, 67 | TDD_A | 33, 34, 35, 36, 37, 38, 39, 40, 45 | FS3_A | - |
| В | FDD_B | 65, 66 Note 5 | TDD_B | - | FS3_B | - |
| С | FDD_C | 9, 30 | TDD_C | 42, 43 | FS3_C | - |
| D | FDD_D | 28 | TDD_D | - | FS3_D | - |
| Е | FDD_E | 2, 5, 7, 27 | TDD_E | 41, 44 | FS3_E | - |
| F | FDD_F | 26 Note 3 | TDD_F | - | FS3_F | - |
| G | FDD_G | 3, 8, 12, 13, 14, 17, 20, 22, 29 Note 2 | TDD_G | - | FS3_G | 46 |
| Н | FDD_H | 25 | TDD_H | - | FS3_H | - |
| I | FDD_I | - | TDD_I | - | FS3_I | - |
| J | FDD_J | - | TDD_J | - | FS3_J | - |
| K | FDD_K | - | TDD_K | - | FS3_K | - |
| L | FDD_L | - | TDD_L | - | FS3_L | - |
| М | FDD_M | - | TDD_M | - | FS3_M | - |
| N | FDD_N | 31 | TDD_N | - | FS3_N | - |

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

3.6 General

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.

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

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.

NOTE 5: 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.

- 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 uplink-downlink 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 with eDRX apply only to non-CA requirements.

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.

4.2.2 Requirements

The UE shall search every layer of higher priority at least every $T_{higher_priority_search} = (60 * N_{layers})$ seconds, 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

 $K_{carrier,reduced}$: 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_{IUTRA 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 $K_{carrier,normal} \le 3$ 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 $N_{UTRA\ carrier\ normal} \le 3$. 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. 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. $N_{UTRA_carrier,normal} = N_{UTRA_carrier,normal} = N_{UTRA_carrier,reduced} = 0$ and $N_{UTRA_carrier,reduced} = 0$ and $N_{UTRA_carrier,reduced} = 0$. 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 has evaluated 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 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 10 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in [1].

Table 4.2.2.1-1: N_{serv}

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 $T_{measure,EUTRAN_Intra}$ (see table 4.2.2.3-1) 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 $T_{\text{measure,EUTRAN_Intra}}/2$

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 $T_{\text{evaluate,E-UTRAN_intra}}$ when $T_{\text{reselection}} = 0$ as specified in table 4.2.2.3-1 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 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.

| 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) |
| 2.56 | 58.88 (23) | 2.56 (1) | 7.68 (3) |

Table 4.2.2.3-1: T_{detect,EUTRAN Intra}, T_{measure,EUTRAN Intra} and T_{evaluate, E-UTRAN intra}

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.

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. An inter-frequency cell is considered to be detectable according to RSRP, RSRP £s/Iot, SCH RP and SCH £s/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 $T_{\text{measure},E-}$ $_{\text{UTRAN_Inter}}$. 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.

The UE shall measure RSRP or RSRQ at least every $K_{carrier,normal} * T_{measure,EUTRAN_Inter}$ (see table 4.2.2.4-1) 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 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.

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 $K_{carrier,normal}$ * $T_{evaluate,E-UTRAN_Inter}$, 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 $T_{reselection} = 0$ as specified in table 4.2.2.4-1 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 inter-frequency 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.

| 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}

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).

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.

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.

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 $T_{detectUTRA_FDD}$ when $T_{detectUTRA_$

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 $Squal \leq S_{nonIntraSearchP}$.

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.

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 $(N_{UTRA_carrier,normal}) * T_{evaluateUTRA_FDD}$ if the cell is in normal performance group and within 6 * $N_{UTRA_carrier,reduced} * T_{evaluateUTRA_FDD}$ if the cell is in reduced performance group when $T_{reselection} = 0$ as speficied in table 4.2.2.5.1-1 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.

| 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 $T_{evaluateUTRA_FDD}$

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. 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.

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 $Squal \leq S_{nonIntraSearchP}$ when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6dB.

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 $Squal \leq S_{nonIntraSearchP}$.

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.

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 $N_{UTRA_carrier_TDD,normal} *T_{evaluateUTRA_TDD}$ if the cell is in normal performance group and within $6 * N_{UTRA_carrier_TDD,reduced} * T_{evaluateUTRA_TDD}$ if the cell is in reduced performance group when $T_{reselection} = 0$ as specified in table 4.2.2.5.2-1 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.

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

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

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} (see table 4.2.2.5.3-1).

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.

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) |

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 $T_{\text{evaluateHRPD}}$.

Table 4.2.2.5.4-1 gives values of $T_{measure HRPD}$ and $T_{evaluate HRPD}$.

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) |

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 $T_{evaluateCDMA2000_1X}$.

Table 4.2.2.5.5-1 gives values of T_{measureCDMA2000 1X} and T_{evaluateCDMA2000 1X}.

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) |

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.

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.

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 $T_{\text{SI-UTRA}} + 50$ ms. For E-UTRAN to GSM cell reselection the interruption time must not exceed $T_{\text{BCCH}} + 50$ 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.

 $T_{SI-UTRA}$ 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.

 $T_{SI-HRPD}$ 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.

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-UTRAccording 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.

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 | multipath |
| 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 | | |
| 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 | Of | f |
| RSRP Note2 | dBm/15 KHz | -110 | -110 |
| | 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 | | |
| | | | |
| of success on every attempt made by UE | | | |

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

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 | | | T | |
| 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 | N1/A | -12 | |
| AICH_Ec/lor | dB | N/A | -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 | | | | |

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

4.3 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

The MBSFN RSRP measurement requirements for UEs in RRC_IDLE and the corresponding MBSFN RSRP measurement report mapping are the same as specified in Section 8.9.2 and 9.8.2.

4.4.3 MBSFN RSRQ measurements

The MBSFN RSRQ measurement requirements for UEs in RRC_IDLE and the corresponding MBSFN RSRQ measurement report mapping are the same as specified in Section 8.9.3 and 9.8.3.

4.4.4 MCH BLER measurements

The MCH BLER measurement requirements for UEs in RRC_IDLE and the corresponding MCH BLER measurement report mapping are the same as specified in Section 8.9.4 and 9.8.4.

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. The requirements in this section shall apply provided that the sidelink used by the UE for ProSe Direct Communication and/or ProSe Direct Discovery is on the carrier of the serving cell.

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 the PCell, 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 the PCell, or
- when receiving ProSe direct communication signals, or
- while switching receiver chain ON/OFF for ProSe Direct Comunications 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: Tevaluate.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.

15.36 (6)

Table 4.5.2.4-1: T_{evaluate,SLSS} with ProSe Direct Communication

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.

2.56

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 parameters are not configured; or
- DRX parameters are configured and
 - o drx-InactivityTimer is running; or
 - o drx-RetransmissionTimer is running; or
 - mac-ContentionResolutionTimer is running; or
 - a Scheduling Request sent on PUCCH is pending; or
 - 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

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

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 8.1.2.2.2 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 $T_{\rm IU}$ 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 Tinterrupt1

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

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

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

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_{MC}

| $\mathrm{T_{IU}}$ | is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN |
|-------------------|--|
| | cell, T _{III} 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 $T_{interrupt1}$

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

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

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_{SEN} 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 $SW_K = \left\lceil \frac{srch_win_k}{60} \right\rceil$ 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 =
$$\left[\frac{\text{srch_win_o}}{60}\right]$$
 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_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1X cell. T_{IU} can be up to one cdma2000 1X frame (20 ms).

$$SW_K$$
 is $SW_K = \left\lceil \frac{srch_win_k}{300} \right\rceil$ 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.

6.3 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-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:

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

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io > -6 dB,
- DwPCH_Ec/Io \geq -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 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 $(N_{TA_Ref} + N_{TA_offset}) \times T_s$. 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. $(N_{TA_Ref} + N_{TA_offset})$ (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 cycle or there is no DRX 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 $(N_{\text{TA_Ref}} + N_{\text{TA offset}}) \times T_s$ 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 μs |

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 | ≤1.33 + Tpropagation US |

- 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 ($T_{Evaluate}Q_{in_DRX}$) is 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 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 $T_{\text{Evaluate}} Q_{\text{out_DRX}}$ [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 $T_{\text{Evaluate}} Q_{\text{out_DRX}}$ [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]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_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: Evaluation period length in time depends on the length of | | gth 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 7.6.2.2-2: 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: | ote 1: Evaluation period length in time depends on the length of | |
| | the DRX cycle in use | |
| Note 2: | e 2: MCG's DRX configuration is applied for PCell RLM | |
| | evaluation and SCG's DRX configuration is applied for | |
| PSCell RLM evaluation | | |

7.6.2.3 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(10 ms, MCG_DRX_cycle_length). The out-of-sync and in-sync evaluations of the 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 max(10 ms, SCG_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 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.

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 two or three 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 $n+T_{activate_basic}$ 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 $n+T_{delay_PUCCH_multiple_SCells}$ and shall transmit valid CSI report for the SCell being activated on the PUCCH SCell no later than in subframe $n+T_{delay_PUCCH_multiple_SCells}$, 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.

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.

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 two or three 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.

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.

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.

$$T_{activate\ basic\ FS3} = [12] \text{ ms} + [T_{DMTC\ duration}] + (L+[1]) * T_{DMTC\ periodicity}$$
, where

 $T_{DMTC duration} \ge TBD$ 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 Muliple Downlnk 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.x,

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

 K_i (0 \leq K_i \leq [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 Muliple Downlnk 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.(x+1) 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 [2] 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 [2] 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 an SCell 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 thedeactivated 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.

7.9 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 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:

- 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 3.1.

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 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 average RS RE energy | 1 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. |
| 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 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. | |

7.11.2 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 ($T_{Evaluate}_Q_{in_DRX_Cat0}$) is specified in Table 7.11.2.2-1 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]. 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 7.11.2.2-1: 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 | |

7.11.2.3 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.

7.11.3 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 ($T_{Evaluate} = Q_{in} = Q_{in} = Q_{in} = Q_{out} = Q_{$

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]. 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 7.11.3.2-1: 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 | Note (5) |
| Note: Evaluation period length in time depends on the length of | |
| the DRX 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. 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 of the serving cell (RRC_IDLE) or PCell (RRC_CONNECTED).

7.16.2 Requirements

7.16.2.1 ProSe UE transmission timing

The requirements in this clause are applicable when the ProSe transmission timing is derived using the serving cell (RRC_IDLE) or PCell (RRC_CONNECTED) as reference. 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.

7.16.3 Interruptions with ProSe

This section contains the requirements related to the interruptions on PCell due ProSe Direct Discovery and ProSe Direct Communication. The requirements in this subclause are applicable only to ProSe on E-UTRA FDD 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 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.

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 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.

7.16.3.3 Interruptions during ProSe Direct Discovery

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 the eNodeB.

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.

The interruptions are for both uplink and downlink of PCell. 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.

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 in the SCG if the UL transmission timing difference exceeds 35.21µs. 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 500µs.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.

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.

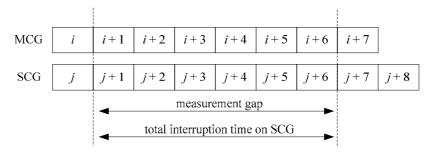
ProSe capable UE is allowed to perform ProSe transmissions during the measurement gaps that are not used for measurements if the requirements specified in section 8 for inter-frequency and inter-RAT measurements are fulfilled.

Table 8.1.2.1-1: Gap Pattern Configurations supported by the UE

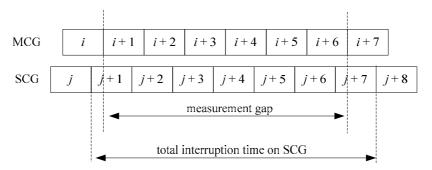
| Gap Pattern Id | MeasurementGap Length (MGL, ms) | Measurement Gap Repetition Period (MGRP, ms) | Minimum available time for inter-frequency and inter-RAT measurements during 480ms period (Tinter1, ms) | Measurement Purpose |
|-------------------|------------------------------------|--|---|--|
| 0 | 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 |

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_{inter1}=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:

$$N_{freq} = N_{freq, E-UTRA} + N_{freq, UTRA} + M_{gsm} + N_{freq, cdma2000} + N_{freq, HRPD}$$

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.

MeasScaleFactor | K_n | K_r information element settting

Table 8.1.2.1.1-1: Measurement Scaling factor Configurations supported by the UE

| SI DOTAT CIT | O | 0/ / | O |
|--------------|----|-------|----|
| 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:

$$N_{freq} = N_{freq,n} + N_{freq,r}$$

ef_FIJTR A_cf1

Where:

 $N_{\text{freq},n} = N_{\text{freq}, \text{ E-UTRA}, \text{normal}} + N_{\text{freq}, \text{ UTRA}, \text{ normal}} + M_{\text{gsm}} + N_{\text{freq}, \text{ cdma2000}} + N_{\text{freq}, \text{ HRPD}} : \text{Total number of interfrequency carriers to be monitored with normal measurement performance}$

 $N_{\text{freq,r}} = N_{\text{freq, E-UTRA, reduced}} + N_{\text{freq, UTRA, reduced}}$: Total number of interfrequency carriers to be monitored with reduced measurement performance

Where:

N_{freq. E-UTRA,normal}: Number of interfrequency carriers to be monitored with normal performance

N_{freq. E-UTRA.reduced}: Number of interfrequency carriers to be monitored with reduced performance

N_{freq, UTRA, normal}: Number of UTRA carriers (FDD and TDD) 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 $N_{freq,\ UTRA,reduced}$ 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 $N_{\text{freq, E-UTRA, normal}} \leq 3$ or if $N_{\text{freq,n=}}$ N_{freq} . The minimum perforformance 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 $N_{\text{freq, UTRA, normal}} \leq 3$ or if $N_{\text{freq,n=}}$ 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

 $X_{\text{basic measurement FDD}} = 8 \text{ (cells)},$

 $T_{\text{Measurement_Period, Intra}} = 200 \text{ ms}$ 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 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 ± 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

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

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.

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. 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-< 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 | | | | |
| cyc | cle 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

$$T_{\text{identify intra}} = T_{\text{basic identify }\textit{E-UTRA_TDD, intra}} \cdot \frac{T_{\text{Measurement Period, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

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: $2 \times \text{TTI}_{\text{DCCH}}$. 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

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 | |

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 9.1.2.1 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.

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. 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-< td=""><td>Note2 (5)</td></drx-<> | Note2 (5) | | |
| cycle≤2.56 | | | |
| Note1: Num | ber of DRX cycle | | |
| depends upon the | | | |
| | RX 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 9.1.2.1 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: $2 \times \text{TTI}_{DCCH}$. 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 $_{identify_intra}$ 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 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 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 all the DRX cycles specified in TS 36.331 [2] are 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 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. 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 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 all the DRX cycles specified in TS 36.331 [2] are 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 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 | | |
| Note 1: When a UE is | E is configured with EIMTA- | | |

Note 1: When a UE is configured with EIMTA-MainConfigServCell 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. 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:

$$\mathbf{T}_{\text{Identify_Inter}} = \mathbf{T}_{\text{Basic_Identify_Inter}} \cdot \frac{480}{\mathbf{T}_{\text{Interl}}} \cdot N_{\textit{freq},n} \cdot K_{n} \quad \textit{ms} \text{ (normal performance) and } \mathbf{T}_{\text{Interl}} \cdot \mathbf{T}_{\text{Interl}}$$

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter}}} \cdot N_{freq,r} \cdot K_r \quad \textit{ms} \, (\text{reduced performance})$$

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.

 $N_{\text{freq,n}} \, N_{\text{freq,r}} \, K_n$ 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] |
|--------------------|--|---|-------------------------------|
| | $480 \times K_n \times N_{freq,n}$ | $480 \times K_r \times N_{freq,r}$ | 6 |
| 0 | | | |
| 1 (Note) | $240 \times K_n \times N_{freq,n}$ | 240 x K _r x N _{freq,r} | 50 |
| Note: This configu | ration 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.

8.1.2.3.1.1.1.3 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 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 $T_{identify\ inter}$ as shown in table 8.1.2.3.1.2-1

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 cycles), reduced performance | | |
|--|--|---|---|--|--|
| 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*K _n *N _{freq,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 _{freq,n}) | *N _{freq,n}) | *N _{freg.r}) | *N _{freg,r}) | |
| cycle≤2.56 | | | 04,,, | 54,17 | |
| Note: Time depends upon the DRX 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.

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 defined in table 8.1.2.3.1.2-2 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

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 depends upon the DRX cycle in use | | | | | |

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.3.1 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,

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter1}}} \cdot N_{\text{freq}} \quad ms,$$

- When configuration 2 or configuration 3 in Table 8.1.2.3.2.1-1 is applied,

$$\mathbf{T}_{\text{Identify_Inter}} = \mathbf{T}_{\text{Basic_Identify_Inter}} \cdot \frac{480}{\mathbf{T}_{\text{Inter}}} \cdot N_{\textit{freq}} + 240 \cdot N_{\textit{freq}} \quad \textit{ms} \; .$$

 $T_{Basic_Identify_Inter} = 480$ 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 Ês/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 ($T_{\text{Measurement_Period_TDD_Inter}$) 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) | | DWPTS | | T _{Measurement_Period} _ _{TDD_Inter} [ms] (normal performance) | 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· <i>T</i> _s | 480 x K _n x N _{freq,n} | $480 \times K_r \times N_{freq,r}$ |
| 1 (Note 1) | 50 | 2 | 2 | $19760 \cdot T_{\rm s}$ | 20480·T _s | 240 x K _n x N _{freq,n} | 240 x K _r x N _{freq,r} |
| 2 | 6 | 1 | 3 | 19760 · T _s | 20480·T _s | 720 x K _n x N _{freq,n} | $720 \times K_r \times N_{freq,r}$ |
| 3 (Note 1) | 50 | 1 | 3 | 19760 · T _s | 20480·T _s | 480 x K _n x N _{freq,n} | 480 x K _r x N _{freq,r} |
| Note 1: This configuration is optional 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_{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 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 $T_{identify\ inter}$ as shown in table 8.1.2.3.2.2-1

| DRX cycle length (s) | T _{identify_inter} (s) (DRX cycles) (normal performance) | | T _{identify_inter} (s) (DRX cycles) (reduced performance) | | |
|--|---|---|---|---|--|
| | 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 8.1.2.3.2.2-1: Requirement to identify a newly detectable TDD interfrequency cell

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.

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 defined in Table 8.1.2.3.2.2-2 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.1.2.3.2.2-2: Requirement to measure TDD interfrequency cells

| DRX cycle length (s) | T _{measure_inter} (s) (DRX cycles) (normal | T _{measure_inter} (s) (DRX cycles) (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-< 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 depends upon the DRX cycle in use | | | |

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.3.1 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

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: $2 \times TTI_{DCCH}$. 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 8.1.2.3.2.2. 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.

The requirements in clause 8.1.2.3.1.2 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.

The requirements in clause 8.1.2.3.2.2 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 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 all the DRX cycles specified in TS 36.331 [2] are 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 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. 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 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.2.4 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 all the DRX cycles specified in TS 36.331 [2] are 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 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: | The requirement for other TDD UL/DL | | | |
| | configuration is TBD. | | | |

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. 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 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 all the DRX cycles specified in TS 36.331 [2] are 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 8.1.2.3.7.1-1 on PCell or each of activated SCell(s), 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 8.1.2.3.7.1-1: 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 cell. | | |
| Note 2: | The requirement for other TDD UL/DL configuration is TBD. | | |

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. 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 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 all the DRX cycles specified in TS 36.331 [2] are 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 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. 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

$$\mathbf{T}_{\text{identify, UTRA_FDD}} = \mathbf{T}_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{\mathbf{T}_{\text{interl}}} \cdot \mathbf{K}_n \cdot \mathbf{N}_{\textit{Freq},n} \quad \textit{ms} \; \text{(normal performance)},$$

and

$$T_{\text{identify, UTRA_FDD}} = T_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_r \cdot N_{\textit{Freq,r}} \quad \textit{ms} \text{ (reduced performance)}$$

A cell shall be considered detectable when

- 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.

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 $T_{identify,\,enhanced_UTRA_FDD}$:

$$T_{\text{identify, enhanced_UTRA_FDD}} = (T_{\text{basic_identify_enhanced_UTRA_FDD}} \cdot \frac{480}{T_{\text{interl}}} + 480) \; K_n N_{\textit{Freq},n} \quad \textit{ms} \; (\text{normal performance})$$

and

$$\mathbf{T}_{\text{identify, enhanced_UTRA_FDD}} = (\mathbf{T}_{\text{basic_identify_enhanced_UTRA_FDD}} \cdot \frac{480}{\mathbf{T}_{\text{inter1}}} + 480) \; K_r N_{\textit{Freq,r}} \quad \textit{ms} \; (\text{reduced performance})$$

A cell shall be considered detectable when:

- CPICH Ec/Io \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. 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

$$T_{\text{measurement_UTRA_FDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_FDD}}, T_{\text{basic_measurement_UTRA_FDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_n \cdot N_{\textit{Freq,n}} \right\} ms \text{ (normal performance)}$$

and

$$T_{\text{measurement_UTRA_FDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_FDD}}, T_{\text{basic_measurement_UTRA_FDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_r \cdot N_{\textit{Freq,r}} \right\} ms \text{ (reduced performance)}$$

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 $T_{Measurement\ UTRA\ FDD}$.

 $X_{basic\ measurement\ UTRA\ FDD} = 6$

 $T_{Measurement_Period\ UTRA_FDD} = 480\ ms.$ 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.

 $N_{freq,r}$, $N_{freq,r}$, 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

8.1.2.4.1.1.3 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 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} as shown in table 8.1.2.4.1.2-1

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 | | T _{identify_UTRA_FDD} (s) (DRX cycles) 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) | $\begin{array}{cccc} 4.8^* \; K_n^* \; \; N_{freq,n} \\ (37.5^* \; K_n^* \; \; N_{freq,n}) \end{array}$ | 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 | RX 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.

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 with the measurement period defined in table 8.1.2.3.1.2-2 when DRX is used, 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

| DRX cycle length (s) | T _{measure_UTRA_FDD} (s) (DRX cycles) normal requirement | | T _{measure_UTRA_FDD} (s) (DRX cycles) 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}) | |

Table 8.1.2.4.1.2-2: Requirement to measure UTRA FDD cells

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-LITRAN TOD - | - LITRAN EDD | measurements when | no DRY is used |
|-------------|----------------|---------------|-------------------|------------------|
| 0.1.2.4.2.1 | E-UIKAN IUU- | - U I KAN FUU | measurements when | I NO DRA IS USEU |

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

$$T_{\text{identify, UTRA_TDD}} = Max \left\{ 5000, T_{\text{basic identify UTRA_TDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_n \cdot N_{Freq,n} \right\} ms \text{ (normal requirement)},$$

and

$$T_{\text{identify, UTRA_TDD}} = Max \left\{ 5000, T_{\text{basic identify UTRA_TDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_r \cdot N_{Freq,r} \right\} ms \text{ (reduced requirement)}$$

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 $T_{identify,\,enhanced\,\,UTRA\,\,TDD}$:

$$T_{\text{identify, enhanced_UTRA_TDD}} = (T_{\text{basic_identify_enhanced_UTRA_TDD}} \cdot \frac{480}{T_{\text{interl.}}} + 480) \cdot K_n \cdot N_{\textit{Freq,n}} \quad \textit{ms} \text{ (normal requirement)},$$

and

$$\mathbf{T}_{\text{identify, enhanced_UTRA_TDD}} = (\mathbf{T}_{\text{basic_identify_enhanced_UTRA_TDD}} \cdot \frac{480}{\mathbf{T}_{\text{interl}}} + 480) \cdot K_r \cdot N_{\textit{Freq,r}} \quad \textit{ms} \text{ (reduced requirement A cell for the property of the p$$

shall be considered detectable when:

- P-CCPCH_Ec/Io \geq -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

$$T_{\text{measurement UTRA_TDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_TDD}}, T_{\text{basic measurement UTRA_TDD}}, \frac{480}{T_{\text{interl}}} \cdot K_n \cdot N_{\textit{Freq,n}} \right\} ms$$
(normal performance,

and

$$T_{\text{measurement UTRA_TDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_TDD}} \cdot T_{\text{basic measurement UTRA_TDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_r \cdot N_{\textit{Freq},r} \right\} ms \text{ (reduced performance)}$$

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.

 $N_{\text{freq,n}}$, $N_{\text{freq,r}}$, 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.

(20*K_r * N_{freq,r})

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 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 $T_{identify,UTRA_TDD}$ as shown in table 8.1.2.4.3.2-1

T_{identify_UTRA_TDD} (s) (DRX cycles) T_{identify_UTRA_TDD} (s) (DRX cycles) **DRX** cycle (normal requirement) (reduced requirement) length (s) Gap period = 40 Gap period = 80Gap period = 80 Gap period = 40ms 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-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-Note (20*K_n Note (20*K_r * Note Note

Table 8.1.2.4.3.2-1: Requirement to identify a newly detectable UTRA TDD cell

A cell shall be considered detectable provided following conditions are fulfilled: A cell shall be considered detectable when

N_{freq,r})

(20*K_n * N_{freg,n})

- P-CCPCH Ec/Io \geq -8 dB,

cycle≤2.56

Note:

- DwPCH_Ec/Io \geq -5 dB.

When L3 filtering is used an additional delay can be expected.

 $N_{freq,n}$

Time depends upon the DRX cycle 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 defined in table 8.1.2.4.3.2-2 when DRX is used, 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.

| DRX cycle length (s) | | (s) (DRX cycles) quirement) | T _{measure_UTRA_TDD} (s) (DRX cycles) (reduced requirement) | | |
|---|--|---|--|---|--|
| | Gap period = 40 | Gap period = 80 | Gap period = 40 | Gap period = 80 | |
| | ms | 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 | |
| 0.064 | 0.48*K _n *N _{freq,n} | $0.8*K_n*N_{freq,n}$ | 0.48* K _r * N _{freq,r} | 0.8* K _r * N _{freq,r} | |
| | $(7.5*K_n *N_{freq,n})$ | (12.5*K _n *N _{freq,n}) | (7.5* K _r * N _{freq,r}) | (12.5* K _r * N _{freq,r}) | |
| 0.08 | 0.48*K _n *N _{freq,n} | 0. 8*K _n *N _{freq,n} | 0.48* K _r * N _{freq,r} | 0. 8* K _r * N _{freq,r} | |
| | (6*K _n *N _{freq,n}) | $(10*K_n *N_{freq,n})$ | $(6* K_r^* N_{freq,r})$ | $(10^* K_r^* N_{freq,r})$ | |
| 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} | |
| | (5*K _n *N _{freq,n}) | $(6.25*K_n *N_{freq,n})$ | (5* K _r * N _{freq,r}) | (6.25* N _{freq,r}) | |
| 0. | Note (5*K _n | Note (5*K _n | Note (5* K _r * | Note (5* K _r * | |
| 128 <drx-< td=""><td>*N_{freq,n})</td><td>*N_{freq,n})</td><td>$N_{freq,r}$)</td><td>$N_{freq,r}$)</td></drx-<> | *N _{freq,n}) | *N _{freq,n}) | $N_{freq,r}$) | $N_{freq,r}$) | |
| cycle≤2.56 | r | , | , | | |
| Note: Time depends upon the DRX cycle in use | | | | | |

Table 8.1.2.4.3.2-2: Requirement to measure UTRA TDD cells

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.

Table 8.1.2.4.5.1.2.1-1

| | T _{identify,gsm} (ms) | | T _{reconfirm,} | _{gsm} (ms) |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| ceil(N _{freq,n} * K _n - M _{gsm}) | 40ms gap configuration (ID 0) | 80ms gap configuration (ID 1) | 40ms gap configuration (ID 0) | 80ms gap configuration (ID 1) |
| 0 | 2160 | 5280 | 1920 | 5040 |
| 1 | 5280 | 21760 | 5040 | 17280 |
| 2 | 5280 | 31680 | 5040 | 29280 |
| 3 | 19440 | No requirement | 13320 | No requirement |
| 4 | 31680 | No requirement | 29280 | No requirement |
| 5 | 31680 | No requirement | 29280 | No requirement |

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_identify,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 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 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 ($N_{GSM\ carrier\ RSSI}$) per DRX cycle. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is shown in table 8.1.2.4.5.2.1-1. The parameters $N_{freq,n}$ 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<="" td=""><td>Note $(5*K_n*N_{freq,n})$</td></drx-cycle≤> | Note $(5*K_n*N_{freq,n})$ | |
| Note: Time depends upon the DRX 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, 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 $K_n*N_{freq,n}*60s$, 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, 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:

$$T_{\text{identify, UTRA_FDD}} = T_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{\text{Tinter1}} \cdot K_n N_{\text{freq,n}} \quad ms \text{ (normal requirement)}$$

and

$$\mathbf{T}_{\text{identify, UTRA_FDD}} = \mathbf{T}_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{\text{Tinter1}} \cdot K_r N_{\textit{freq,r}} \quad \textit{ms} \, (\text{reduced requirement})$$

 $T_{basic_identify_UTRA_FDD} = 300$ 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 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 $T_{identify,\,UTRA_FDD}$ as defined in table 8.1.2.4.7.1.2-1.

| DRX cycle length (s) | T _{identify, UTRA_FDD} (s) (DRX cycles) (normal requirement) | | T _{identify, UTRA_FDD} (s) (DRX cycles) (reduced requirement) | |
|--|---|---|--|---|
| | Gap period = 40 ms | Gap period = 80 ms | Gap period = 40 ms | Gap period = 80 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< td=""><td>Note (45*K_n* N_{freq,n})</td><td>Note $(95*K_n * N_{freq,n})$</td><td>Note (45*K_r* N_{freq,r})</td><td>Note (95*K_r * N_{freq,r})</td></drx<> | Note (45*K _n * N _{freq,n}) | Note $(95*K_n * N_{freq,n})$ | Note (45*K _r * N _{freq,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,n}) | (62.5*K _n * N _{freq,n}) | N _{freq,r}) | * 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}) |
| 0.256 | 6.4*K _n * N _{freq,n} (25*K _n * | 8.96*K _n * N _{freq,n} | 6.4*K _r * N _{freq,r} (25*K _r * | 8.96*K _r * N _{freq,r} (35*K _r |
| | N _{freq,n}) | (35*K _n * N _{freq,n}) | N _{freq,r}) | * N _{freq,r}) |
| 0.32 | 8*K _n * N _{freq,n} (25*K _n * | 8.96*K _n * N _{freq,n} | 8*K _r * N _{freq,r} (25*K _r * | 8.96*K _r * N _{freq,r} (28*K _r |
| | N _{freq,n}) | (28*K _n * N _{freq,n}) | N _{freq,r}) | * N _{freq,r}) |
| 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 | , - | | • | · |
| Note: Time depends | upon the DRX cycle in us | e | | |

Table 8.1.2.4.7.1.2-1: Requirement to identify a new UTRA FDD cell for SON

A cell shall be considered identifiable provided 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 $8*T_{identify, UTRA_FDD}$ seconds, the UE may stop searching UTRA cells for SON; $T_{identify, UTRA_FDD}$ is defined in table 8.1.2.4.7.1.2-1.

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 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

$$\mathbf{T}_{\text{measurement_CDMA2000_lx}} = \mathbf{T}_{\text{basic_measurement_CDMA2000_lx}} \cdot N_{\textit{Freq},n} \cdot K_{n} \cdot S_{\textit{gap}}$$

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 8.1.2.4.9.1-1. 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:

$$T_{\text{identify, UTRA_TDD}} = T_{\text{basic_identify_UTRA_TDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot K_n \cdot N_{Freq,n} \quad ms \text{ (normal requirement)}$$

and

$$\mathbf{T}_{\text{identify, UTRA_TDD}} = \mathbf{T}_{\text{basic_identify_UTRA_TDD}} \cdot \frac{480}{\mathbf{T}_{\text{interl}}} \cdot K_r \cdot N_{\textit{Freq,r}} \quad \textit{ms} \; (\text{reduced requirement})$$

 $T_{basic_identify_UTRA_TDD} = 800 \text{ ms.}$ 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 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 $T_{identify, \, UTRA_TDD}$ as defined in table 8.1.2.4.13.1.2-1.

| 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 Requirements in clause 8.1.2.4.3.1 are applicable | Non DRX Requirements in clause 8.1.2.4.3.1 are applicable | Non DRX Requirements in clause 8.1.2.4.3.1 are applicable | Non DRX Requirements in clause 8.1.2.4.3.1 are applicable |
| 0.16 <drx cycle≤0.256</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}) |
| 0.256 <drx cycle≤0.32</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}) |
| 0.32 <drx cycle≤2.56</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}) |
| Note: Time depends upon the DRX cycle in use | | | | |

Table 8.1.2.4.13.1.2-1: Requirement to identify a new UTRA TDD cell for SON

A cell shall be considered identifiable provided following conditions are fulfilled:

- P-CCPCH Ec/Io > -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; $T_{identify,\ UTRA_TDD}$ is defined in table 8.1.2.4.13.1.2-1.

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 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

$$\mathbf{T}_{\text{measurement_CDMA2000_1x}} = \mathbf{T}_{\text{basic_measurement_CDMA2000_1x}} \cdot N_{\textit{Freq,n}} \cdot K_{\textit{n}} \cdot S_{\textit{gap}}$$

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 is used or not, the UE shall be able to identify a new CGI of UTRA FDD cell within:

$$T_{\text{identify_CGI, UTRAN FDD}} = 630 + 40 * SIB3_REP \ ms$$

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 \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. 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 all the DRX cycles specified in TS 36.331 [2] are 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. 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 IEEE 802.11 RSSI shall be $T_{\rm IEEE\ RSSI}$ as defined in table 8.1.2.4.19.2.1-1.

The value of T_{IEEE_RSSI} depends upon whether the 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 IEEE 802.11 RSSI measurements for certain minimum number of APs during $T_{\text{IEEE_RSSI}}$ as defined in table 8.1.2.4.19.2.1-1. The UE physical layer shall be capable of reporting RSSI measurements to higher layers with the measurement period of $T_{\text{IEEE_RSSI}}$.

Table 8.1.2.4.19.2.1-1: IEEE 802.11 RSSI measurement period

| IEEE 802.11 RSSI measurement | T _{IEEE_RSSI} [seconds] | |
|--|--|-----|
| Type of Measurement | Minimum number of APs measured during T _{IEEE_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 IEEE 802.11 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 no DRX is used the measurement period for IEEE 802.11 RSSI shall be $T_{RSSI\ DRX}$ as defined in table 8.1.2.4.19.2.2-1.

The value of $T_{IEEE_RSSI_DRX}$ depends upon whether the 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 IEEE 802.11 RSSI measurements for certain minimum number of APs during $T_{IEEE_RSSI_DRX}$ as defined in table 8.1.2.4.19.2.2-1. The UE physical layer shall be capable of reporting RSSI measurements to higher layers with the measurement period of $T_{IEEE_RSSI_DRX}$.

| 0.002 ≤ DRX-cycle ≤ 0.320 | MAX (0.5, 5*L _{DRX}) |
|---------------------------|--|
| 0.002 ≤ DRX-cycle ≤ 0.320 | MAX (5, 25*L _{DRX}) |
| 0.320 < DRX-cycle ≤ 2.56 | MAX (5, 20*L _{DRX}) |
| 0.002 ≤ DRX-cycle ≤ 0.320 | MAX (30, 150*L _{DRX}) |
| 0.320 < DRX-cycle ≤ 2.56 | MAX (30, 120*L _{DRX}) |
| 0 | 0.002 ≤ DRX-cycle ≤ 0.320 0.320 < DRX-cycle ≤ 2.56 0.002 ≤ DRX-cycle ≤ 0.320 |

Table 8.1.2.4.19.2.2-1: Requirement to measure IEEE 802.11 RSSI in DRX

The IEEE 802.11 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_{IEEE_RSSI} when no DRX is used as defined in section 8.1.2.4.19.2.1 and $T_{IEEE_RSSI_DRX}$ 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 all the DRX cycles specified in TS 36.331 [2] and all eDRX cycles.

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

 $T_{RSTD\ IntraFreoFDD.\ E-UTRAN}$ 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} ($1 \le N_{PRS} \le 6$) 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 $T_{RSTD IntraFreqFDD, E-UTRAN}$ 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 ,

 $(PRS \hat{E}_s / Iot)_{ref}$ and $(PRS \hat{E}_s / Iot)_i$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning

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 $T_{\text{RSTD IntraFreqFDD, E-UTRAN}}$ 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 $T_{\text{RSTD Intra-Freq-FDD. E-UTRAN. HO}}$.

 $T_{\rm HO}$ 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.

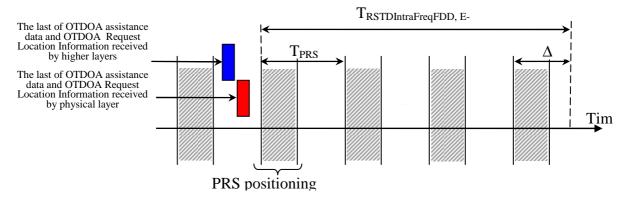


Figure 8.1.2.5.1-1. Illustration of the RSTD reporting time requirement in an FDD system.

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

 $T_{RSTD\ IntraFreqTDD,\ E-UTRAN}$ 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 8.1.2.5.2-1, where a PRS positioning occasion is as defined in Clause 8.1.2.5.1, and

 $\Delta = 160 \cdot \left| \frac{n}{M} \right|$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time

and the processing time.

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,

 $(PRS \hat{E}_s / Iot)_{ref}$ 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.2.5 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

 $(T_{RSTD\ IntraFreqTDD,\ E-UTRAN,\ HO})$ shall be according to the following expression:

$$T_{\text{RSTD IntraFreqTDD, E-UTRAN, HO}} = T_{\text{RSTD IntraFreqTDD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{HO}} \qquad ms ,$$

where:

K is the number of times the intra-frequency handover occurs during $T_{\text{RSTD Intra}\text{FreqTDD, E-UTRAN, HO}}$,

 $T_{\rm HO}$ 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 specified 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: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.6 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 all the DRX cycles specified in TS 36.331 [2] and all eDRX cycles.

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:

$$T_{RSTD InterFreqFDD, E-UTRAN} = T_{PRS} \cdot (M-1) + \Delta$$
 ms ,

where

 $T_{RSTD InterFreeFDD, E-UTRAN}$ 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,

 $\Delta = 160 \cdot \left\lceil \frac{n}{M} \right\rceil$ 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 8.1.2.6.1-1: Number of PRS positioning occasions within $T_{RSTD\;InterFreoFDD\;E-UTRAN}$

| Positioning subframe | Number of PRS positioning 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,

 $\left(\text{PRS } \hat{\mathbf{E}}_{s} / \text{Iot} \right)_{ref}$ 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.2.6 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

 $T_{RSTD\ InterFreeTDDFDD\ E-UTRAN}$ 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 $\it M$ | |
|-----------------------------------|---|-----------------|
| 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 TDD 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 $T_{\text{RSTD InterFeqTDDFDD.E-UTRAN}}$, 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.2.6 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:

$$\mathbf{T}_{\text{RSTD InterFreqTDDFDD, E-UTRAN, HO}} = \mathbf{T}_{\text{RSTD InterFreqTDDFDD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{HO}} \qquad \textit{ms}$$

where:

K is the number of times the inter-frequency handover occurs during $T_{\text{RSTD InterFreqTDDFDD, E-UTRAN, HO}}$,

 $T_{\rm HO}$ 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 Tran | nsmission 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: L | 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: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.6.3 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:

$$T_{\text{RSTD InterFreqTDD, E-UTRAN}} = T_{\text{PRS}} \cdot (M - 1) + \Delta$$
 ms

where

 $T_{RSTD\ InterFreeTDD.\ E-UTRAN}$ 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 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 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:

$$(PRS \, \hat{E}_s / Iot)_{ref} \ge -6 \, dB$$
 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 ,

 $(PRS \hat{E}_s / Iot)_{ref}$ and $(PRS \hat{E}_s / Iot)_i$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning

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 $T_{RSTD\,InterFreqTDD,\,E-UTRAN}$ 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:

$$T_{\text{RSTD InterFreqTDD, E-UTRAN, HO}} = T_{\text{RSTD InterFreqTDD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{HO}}$$
 ms,

where:

K is the number of times the inter-frequency handover occurs during $T_{\text{RSTD InterFreqTDD, E-UTRAN, HO}}$,

 $T_{\rm HO}$ 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.

8.1.2.6.3.1 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

 $T_{RSTD InterFeqEDDTDD E-LITRAN}$ 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,

 $\Delta = 160 \cdot \left\lceil \frac{n}{M} \right\rceil$ 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 8.1.2.6.4-1: Number of PRS positioning occasions within $T_{RSTD\ InterFeqFDDTDD.E-UTRAN}$

| Positioning subframe | | Number of PRS positioning occasions 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 Ti | 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: | e2: 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 x TTI_{DCCH}. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.7 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.

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< th=""><th>Note2 (5)</th></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 | | |

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:

$$T_{measure_FDD_UE_Rx_Tx3} = (K+1)*(T_{measure_FDD_UE_Rx_Tx1}) + K*T_{PCcell_change_handover}$$

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:

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 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.

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< th=""><th>Note2 (5)</th></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 | |

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:

$$T_{measure\ TDD\ UE\ Rx\ Tx2} = (N+1)*(T_{measure\ TDD\ UE\ Rx\ Tx1}) + N*T_{PCell\ change\ CA}$$

Where:

N is the number of times the PCell is changed over the measurement period (T_{measure 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 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: $2 \times TTI_{DCCH}$. 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.

8.1.2.7.3 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

 $T_{basic_identify_E\text{-}UTRA_FDD_eICIC,\;intra}$ 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.

$$\mathbf{Y}_{\text{measurement_intra_eICIC}} = Floor \left\{ \boldsymbol{X}_{\text{basic_measurement_FDD_eICIC}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period_eICIC, Intra}} \right\} \text{ cells}$$

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 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.

8.1.2.8.1.1.1.3 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) |
|---|-----------------------|--|
| ≤0.04 | 4 | 1 (Note1) |
| 0.04 <d< td=""><td>RX-</td><td>Note2 (52)</td></d<> | RX- | Note2 (52) |
| cycle≤0 | .08 | |
| 0.128 | 3 | 4.22 (33) |
| 0.128 <drx-< td=""><td>Note2 (28)</td></drx-<> | | Note2 (28) |
| 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 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_elCIC} (s) (DRX cycles) |
|--|-----------------------|---|
| ≤0.04 | 4 | 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 | 2.56 | |
| Note1: Numb | | ber of DRX cycle |
| | depends upon the DRX | |
| | cycle 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.

8.1.2.8.1.2.1 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: $2 \times TTI_{DCCH}$. 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 8.1.2.8.1.2. 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

$$T_{\text{identify_intra_eICIC}} = T_{\text{basic_identify_E-UTRA_TDD_eICIC, intra}} \cdot \frac{T_{\text{Measurement_Period_eICIC, Intra}}}{T_{\text{Intra}}} \quad ms$$

where

T_{basic 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 9.1.2.3 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

 $X_{basic_measurement_TDD_eICIC} = 8$ (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 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 8.1.2.8.2.1. 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_elClC} (s) (DRX cycles) | | |
|--|----------------------|--|--|--|
| ≤0.04 | | 1 (Note1) | | |
| 0.04 <drx-< td=""><td>Note2 (52)</td></drx-<> | | 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: | Number of DRX cycle | | | |
| | depends upon the DRX | | | |
| | | cycle in use | | |
| Note2: | Time | 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) | |
|--|--|---|--|
| ≤0.04 | | 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: | Number of DRX cycle depends upon the DRX cycle 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: $2 \times \text{TTI}_{DCCH}$. 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 $_{identify_intra_eICIC}$ 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 intrafrequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement_intra_FeICIC}} = Floor \left\{ X_{\text{basic_measurement_FDD_FeICIC}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period_FeICIC, Intra}} \right\} \text{ cells}$$

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 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 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

T_{basic_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 (28)<="" 2="" note="" td=""></drx-cycle≤2.56> | |
| 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.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 depends upon the DRX cycle in use. | |
| NOTE 2: 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 9.1.2.5, 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.

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:

Note 3:

number of carriers to monitor beyond 3.

- 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.

Table 8.2.2-1: Requirements for reporting criteria per measurement category

| Measurement category | E _{cat} | Note |
|--|--|--|
| Intra-frequency Note 1 | 9 | 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 measurements for E-CID | 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 | 7/20 | 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]. |
| Note 1: When the UE is configured with SCell, PSC | Cell or PCell | carrier frequency, E _{cat} for Intra-frequency is |
| applied per serving frequency. Note 2: When the UE is configured with one SCell least 2 reporting criteria for all RSTD meas frequency, SCell carrier frequency and intecarrier frequencies, the UE shall be capable measurements configured to be performed. | carrier freque surements co er-frequency e of supporti on PCell ca | ency, the UE shall be capable of supporting at nfigured to be performed on PCell carrier carrier. When the UE is configured with two SCell |

Support of Ecat of 20 for Measurement category Inter-frequency is applied for a UE supporting increased

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 $SCH_Brightarrow$ Es/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 $T_{identify_scc} = max(20 measCycleSCell$, $T_{identify_scc1}$). $T_{identify_scc1}$ is given in table 8.3.3.2.2-1.

| 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 | |
| Note1: Numbe | er of DRX cycle depends |
| upon th | ne DRX cycle in use |

Table 8.3.3.2.2-1: Requirement for T_{identify_scc1}

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-< 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 | | |

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 8.3.3.2.2.1.3.

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 $T_{RSTD, E-UTRAN, PCell \ change}$,

 $T_{\rm PRS}$ 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.:

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:

$$T_{\text{RSTD, E-UTRAN, PCell change}} = T_{\text{RSTD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{PCell change}}$$
 ms,

where:

K is the number of times the PCell is changed during $T_{RSTD, E-UTRAN, PCell \ change}$,

 $T_{\rm PRS}$ is defined in clause 8.1.2.5,

 $T_{
m PCell_change}$ 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_{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:

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 ($T_{\text{RSTD, E-UTRAN, PCell change}}$) 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_{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:

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:

$$\mathbf{T}_{\text{RSTD, E-UTRAN, PCell_change}} = \mathbf{T}_{\text{RSTD, E-UTRAN}} + K \times T_{\text{PRS}} + T_{\text{PCell_change}} \qquad \textit{ms} \; ,$$

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 3.1.

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 $Y_{\text{measurement intra}_UE \text{ cat 0}}$ cells , where $Y_{\text{measurement intra}_UE \text{ cat 0}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra}_UE \text{ cat 0}}$ 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

 $X_{basic measurement FDD UE cat 0} = 8 (cells)$

 $T_{Measurement_Period_UE\ cat\ 0,\ Intra} = 400~ms.$ 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

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- note2(20)<="" td=""></drx-> | | |
| cycle≤2.56 | | |
| Note1: Number of DRX cycle | | |
| depends upon the DRX cycle in use | | |
| Note2: Time de | Note2: Time depends upon the DRX | |

cycle in use

A cell shall be considered detectable when

- RSRP related side conditions given in Sections 9.1.13.1 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 Es/Iot according to Annex B.2.1 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra_UE\ cat\ 0}$ as shown in table 8.5.2.1.1.2-2. 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 | | |

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

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

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 $T_{measure_intra_UE\ cat\ 0}$ as shown in table 8.5.2.1.2.2-2. 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-< 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 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.

8.5.2.1.3 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

$$T_{\text{identify intra_UE cat 0}} = T_{\text{basic identify } E-UTRA_TDD_UE cat 0, intra} \cdot \frac{T_{\text{Measurement Period_UE cat 0, Intra}}}{T_{\text{Intra}}} \quad \textit{ms}$$

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

 $X_{\text{basic measurement TDD UE cat 0}} = 8 \text{ (cells)}$

 $T_{Measurement_Period\;intra_UE\;cat\;0}$ = 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.

8.5.2.1.3.1.1 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 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 8.5.2.1.3.1. 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

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 | , , |
| Notal: Number of DDV avala | |

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 9.1.13.1 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 $T_{measure_intra_UE\ cat\ 0}$ as shown in table 8.5.2.1.3.2-2. 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. | | |

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 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 8.5.2.1.3.2. 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 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 all the DRX cycles specified in TS 36.331 [2] are used.

Within the time, $T_{identify_CGI_LC-UE, intra}$ 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 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. 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 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 all the DRX cycles specified in TS 36.331 [2] are used.

Within the time, $T_{identify_CGI_LC-UE, intra}$ 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 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. 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 $T_{identify_intra_SCE_DRX}$.

 $T_{identify_intra_SCE_DRX\ =\ 16*Max\ \{\ T_{DMTC_periodicity},\ DRX\ cycle\ length\} +\ T_{Measurement_Period\ _intra_FDD_CRS_DRX}$

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 $T_{identify_intra_SCE_DRX}$.

 $T_{identify\ intra\ SCE\ DRX\ =} 16* max \{ T_{DMTC\ periodicity}, DRX\ cycle\ length \} + T_{Measurement\ Period\ intra\ TDD\ CRS\ DRX} \}$

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 $T_{Measurement_Period_intra_TDD_CRS_DRX}$

Table 8.6.2.1.2.2-1: Requirement to measure TDD intra frequency cell

| 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 |

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 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 $T_{identify_intra_SCE_DRX}$ 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:

MGRP}*Nfreq

 $T_{Identify_Inter_SCE} = \underline{13} * Max \{T_{DMTC_periodicity}, MGRP\} * N_{freq} + T_{Measurement_Period_inter_FDD_CRS}$

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

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 $T_{identify_inter_SCE_DRX}$.

 $T_{identify_inter_SCE_DRX} = 17*Max \; \{ \; T_{DMTC_periodicity}, \; DRX \; cycle \; length, \; MGRP \} \; *N_{freq} + T_{Measurement_Period_inter_FDD_CRS_DRX} \; description \; T_{identify_inter_SCE_DRX} = 17*Max \; \{ \; T_{DMTC_periodicity}, \; DRX \; cycle \; length, \; MGRP \} \; *N_{freq} + T_{Measurement_Period_inter_FDD_CRS_DRX} \; description \; T_{identify_inter_SCE_DRX} = 17*Max \; \{ \; T_{DMTC_periodicity}, \; DRX \; cycle \; length, \; MGRP \} \; *N_{freq} + T_{Measurement_Period_inter_FDD_CRS_DRX} \; description \; T_{identify_inter_SCE_DRX} = 17*Max \; \{ \; T_{DMTC_periodicity}, \; DRX \; cycle \; length, \; MGRP \} \; *N_{freq} + T_{Measurement_Period_inter_FDD_CRS_DRX} \; description \; T_{identify_inter_SCE_DRX} = 17*Max \; \{ \; T_{DMTC_periodicity}, \; DRX \; cycle \; length, \; MGRP \} \; *N_{freq} + T_{Measurement_Period_inter_FDD_CRS_DRX} \; description \; T_{identify_inter_SCE_DRX} = 17*Max \; T_{identify_inter_SCE_DRX}$

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 \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.

8.6.2.2.2 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:

 $T_{identify_inter_SCE} = 13 * Max \{ T_{DMTC_periodicity}, DRX \ cycle \ length, MGRP \} * N_{freq} + T_{Measurement_Period_inter_TDD_CRS}$

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</i> _{freq} |
| ≥25 | ≥2 | 3 * <i>Max</i> { T _{DMTC_periodicity} , MGRP}* <i>N_{freq}</i> |

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.

8.6.2.2.1.1.3 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.

 $T_{Measurement_Period_inter_TDD_CRS_DRX}$ 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</i> _{freq} |
| ≥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.

8.6.2.2.2.1 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: $2 \times \text{TTI}_{\text{DCCH}}$. 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 $T_{Measurement_Period_intra_FDD_CSI_RS}$ 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: $2 \times TTI_{DCCH}$. 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 \leq 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_intra_FDD_CSI_RS_DRX}$ 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: $2 \times \text{TTI}_{\text{DCCH}}$. 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* <i>Max</i> {T _{DMTC_periodicity} , DRX cycle length, MGRP}* <i>N</i> _{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 _{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.

8.6.3.2.2.1.1 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: $2 \times TTI_{DCCH}$. 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 | $5*Max{T_{DMTC_periodicity}, DRX cycle}$ length, MGRP $}*N_{freq}$ |
| ≥ 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 $T_{identify_scc_CRS}$, 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 (<i>ds-OccasionDuration</i>) [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 $T_{\text{measure_scc_CRS_DRX}}$.

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.2.11 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 (ds-OccasionDuration) [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 $T_{measure_scc_CSI-RS}$.

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 $T_{identify_scc_TP_SC_DRX} = T_{identify_scc_SCE_DRX} + T_{measure_scc_CSI-RS_DRX}$,

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.2.11 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 $T_{measure_scc_CSI-RS_DRX}$.

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/NACK | | K/NACKs | |
|----------------------------|--|-----|------------------------|-----|
| | Synchronous 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:

$$T_{\text{identify CGI, inter}} = T_{\text{basic identify CGI, inter}}$$
 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 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 for E-UTRA Dual Connectivity

8.8.7.1 Introduction

This clause contains SSTD measurement requirements on UE capabilities for support of E-UTRA dual connectivity. Requirements in this clause are applicable to all dual connectivity capable UE which have been configured with PCell and one SCell. Requirements in this clause are applicable for E-UTRA FDD, E-UTRA TDD and E-UTRA TDD-FDD dual connectivity.

8.8.7.2 SSTD Measurements

When no DRX is used the physical layer measurement period of the SSTD measurement shall be 200 ms.

When DRX is used in RRC_CONNECTED state the physical layer measurement period ($T_{measure_FDD_SSTD1}$) of the SSTD measurement shall be as specified in table 8.8.7.2-1.

Table 8.8.7.2-1: FDD SSTD measurement requirement when DRX is used

| | re_FDD_SSTD1 (s) (DRX cycles) | |
|---|-------------------------------|--|
| ≤0.04 0.2 (Note1) | | |
| 0.04 <drx-cycle≤2.56 (5)<="" note2="" td=""></drx-cycle≤2.56> | | |
| Note1: Number of DRX cycle depends upon the DRX cycle in use | | |
| Note2: Time depends upon the DRX cycle in use | | |

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 physical layer measurement period of the SSTD measurement shall not exceed $T_{\text{measure_FDD_SSTD2}}$ as defined in the following expression:

$$T_{\text{measure FDD SSTD2}} = (N+M+1)*(T_{\text{measure FDD SSTD1}}) + N*T_{\text{PCell change DC}} + M*T_{\text{PSCell change DC}}$$

Where:

 $N \ is \ the \ number \ of \ times \ the \ PCell \ is \ changed \ over \ the \ measurement \ period \ (T_{measure_FDD_SSTD2}),$

M is the number of times the PSCell is changed over the measurement period (T_{measure_FDD_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.X.X.

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.X.X.

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 [640] ms 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 in DRX, eDRX, and non-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 [640] ms 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 in DRX mode, for all DRX and eDRX cycle, and in non-DRX mode.

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. 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 of the PCell.

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: Tevaluate St SS 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,

- $T_{\text{evaluate.SLSS}} = 0.4$ 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 cy | cle 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 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 Es/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} SCE₂

 $T_{identify_intra_FS3} = T_{detect\ intra_FS3} + T_{measure\ intra_FS3_CRS}$

where:

T_{detect intra_FS3} 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 TBD are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Section TBD are fulfilled for a corresponding Band,
- SCH_RP is according to Annex B.2.x 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 Ês/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 TBD, and the RSRQ measurement accuracy for all measured cells shall be as specified in Section TBD.

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 TBD and TBD, 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 TBD and TBD, 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 TBD and TBD, 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 FS3 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 $T_{\text{detect intra_FS3_DRX}}$ 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 $T_{measure\ intra\ FS3\ CRS\ DRX}$ 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 TBD are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Section TBD are fulfilled for a corresponding Band,
- SCH_RP is according to Annex B.2.x for a corresponding Band and SCH Ês/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 (<i>ds-OccasionDuration</i>) [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 TBD, and the RSRQ measurement accuracy for all measured cells shall be as specified in Section TBD.

8.11.2.1.1.2.1 Measurement Reporting Requirements

8.11.2.1.1.2.1.1 Periodic Reporting

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in Sections TBD and TBD, respectively.

8.11.2.1.1.2 Event-triggered Periodic Reporting

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in Sections TBD and TBD, 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 TBD and TBD, 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 $T_{identify_intra_TP_FS3}$.

 $T_{identify_intra_TP_FS3} = T_{identify_intra_FS3} + T_{measure_intra_FS3_CSI-RS},$

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 TBD are fulfilled for a corresponding Band,

- SCH_RP is according to Annex B.2.x for a corresponding Band and SCH £s/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 Ês/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 TBD.

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 TBD.

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 TBD.

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 TBD.

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 TBD are fulfilled for a corresponding Band,
- SCH_RP is according to Annex B.2.x for a corresponding Band and SCH £s/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 TBD.

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 TBD.

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 TBD.

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 TBD.

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 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.

8.11.4.2 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 TBD.

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_ES3} 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 TBD are fulfilled for a corresponding Band,
- $SCH_RP|_{dBm}$ is according to Annex B.2.x for a corresponding Band and SCH Ês/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 Ës/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 $T_{measure_SCC_FS3_CRS}$.

The measurement accuracy for all measured cells shall be as specified in Section TBD.

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 TBD are fulfilled for a corresponding Band,
- $SCH_RP|_{dBm}$ is according to Annex B.2.x for a corresponding Band and SCH $\hat{E}s/Iot$ is according to Table 8.12.2.4.2-1.

The measurement period for deactivated scell measurements is $T_{measure_scc_CRS_DRX}$ 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) * <i>Max</i> { <i>measCycleSCell</i> , 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 $T_{\text{measure SCC FS3 CRS DRX}}$.

The measurement accuracy for all measured cells shall be as specified in Section TBD.

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 $T_{identify_scc_CRS}$ 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 $T_{identify_scc_SCE_DRX}$ 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 $T_{measure_scc_CRS_DRX}$ 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 TBD.

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 Ês/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 TBD are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} is according to Annex B.2.(x+1) for a corresponding Band and SCH Ês/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 TBD.

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) * Max{ measCycleSCell, DRX cycle length } |
| ≥6 | [-6] ≤ CSI-RS Ês/lot < [0] | 1 | ([5]+M) * Max{ measCycleSCell, 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 TBD are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} is according to Annex B.2.(x+1) 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 TBD.

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.

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 | ıracy | 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} | | |
| | | | 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: 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 | lo Note 1 range | | | |
| condition | condition | 2 | E-UTRA operating band groups Note 5 | | 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 | |
| ±2 | ±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 | |
| ±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 | uracy | | C | onditions | | | |
|-----------|-----------|--------|---|--|---------------------------|---------------------------|--|
| Normal | Extreme | | lo ^{Note 2} range | | | | |
| condition | condition | Ês/lot | E-UTRA operating band groups ^{Note 4} | Minim | num lo | Maximum Io | |
| dB | dB | dB | | ${ m dBm/} \ { m 15kHz}^{ m Note~1,3}$ | 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 | ≥-4 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 | ≥-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 | ıracy | 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 | | ${ m dBm/}$ 15kHz $^{ m Note~1,5}$ | 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 | uracy | | Conditions | | | | | |
|-----------|-----------|--------|---|----------------|---------------------------|---------------------------|--|--|
| Normal | Extreme | me . | lo ^{Note 2} range | | | | | |
| condition | condition | Ês/lot | E-UTRA operating band groups ^{Note 4} | 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 | | |
| | | ≥-9.46 | 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 | ≥-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

| Accı | ıracy | Conditions | | | | | |
|-----------|-----------|-------------|---|---------------------|---------------------------|--|--|
| Normal | Extreme | Êc/lot Note | lo Note 3 range | | | | |
| condition | condition | Ês/lot Note | E-UTRA operating band groups ^{Note 7} | Minimum Io | Maximum lo | | |
| 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 £s/lot is the minimum £s/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 | ama . | lo ^{Note 1} range | | | | | | |
| condition | condition | Ês/lot | E-UTRA operating band groups Note 3 | Minin | num lo | Maximum Io | | | |
| dB | dB | dB | | dBm/15kHz Note 2 | dBm/BW _{Channel} | dBm/BW _{Channel} | | | |
| | | | FDD_A, TDD_A | -121 | N/A | -70 | | | |
| | | 0.5 ≥-6 dB | 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 | | 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 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 | ıracy | Conditions | | | | | |
|------------------|-------------------|-------------|-------------------------------------|------------------|---------------------------|--|--|
| Normal | Evtrome | Ês/lot Note | lo Note 1 range | | | | |
| Normal condition | Extreme condition | ES/IOT | 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 | ≥-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 | Conditions | | | | | |
|-----------|-----------|------------|---|----------------|---------------------------|---------------------------|--|
| Normal | Extreme | _ | lo 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 | 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 | ≤ 20 dB

Table 9.1.3.2-1: RSRP Inter frequency relative accuracy

| Accı | ıracy | Conditions | | | | | |
|-----------|-------------------|-------------|-------------------------------------|------------------|---------------------------|--|--|
| Normal | Evtromo | Ês/lot Note | lo Note 1 range | | | | |
| condition | Extreme condition | ES/10t | 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 | | |
| ±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 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.

9.1.3A 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 | | Conditions | | | | | |
|-----------|-----------|--------|--|----------------|---------------------------|---------------------------|--|--|
| Normal | Extreme | ne . | 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 | dBm/BW _{Channel} | dBm/BW _{Channel} | | |
| | | | FDD_A, TDD_A | -121 | N/A | -70 | | |
| | | | FDD_B | -120.5 | N/A | -70 | | |
| | | ≥-6 dB | FDD_C, TDD_C | -120 | N/A | -70 | | |
| | | | 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 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

| Accuracy | | Conditions | | | | |
|-----------|-----------|-------------|-------------------------------------|------------------|---------------------------|--|
| Normal | Extreme | Ês/lot Note | lo Note 1 range | | | |
| condition | condition | 2 | 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 | |
| ±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 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

| 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 | |
| | ±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 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

| Accuracy | | Conditions | | | | |
|-----------|-----------|------------|-------------------------------------|--------------------------------|---------------------------|--|
| Normal | Extreme | | lo ^{Note 2} range | | | |
| condition | condition | Ês/lot | E-UTRA operating band groups Note 5 | Minimum Io | Maximum lo | |
| dB | dB | dB | | dBm/ 15kHz Note 1, 4 | dBm/BW _{Channel} | |
| | | | FDD_A, TDD_A | -121 | -50 | |
| | | l ≥-2 dB | FDD_B | -120.5 | -50 | |
| | | | FDD_C, TDD_C | -120 | -50 | |
| | | | FDD_D | -119.5 | -50 | |
| ±2.5 | ±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 | |
| ±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 | |
| | ±4 | ≥-6.96 | 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 | ≥-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.

Table 9.1.5.4-1: WB-RSRQ Intra frequency absolute accuracy

| Accı | ıracy | Conditions | | | | | |
|-----------|-----------|------------|----------------|-------------------------------------|-------------------|---------------------------|--|
| Normal | Extreme | Ês/lot | lo1-lo2 | lo range Note 1 | | | |
| condition | condition | Note 3 | Note 2 | E-UTRA operating band groups Note 6 | Minimum Io Note 5 | Maximum lo | |
| dB | dB | dB | dB | | dBm/15kHz | dBm/BW _{Channel} | |
| | | | | FDD_A, TDD_A | -121 | -50 | |
| | | | 0 ≤lo1- lo2 | FDD_B | -120.5 | -50 | |
| | | | | FDD_C, TDD_C | -120 | -50 | |
| | | | | FDD_D | -119.5 | -50 | |
| ±2.5 | ±4 | ≥-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 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: Io1 is the Io level in the resource blocks other than central 6 resource blocks within the AllowedMeasBandwidth in TS 36.331 [2] and Io2 is the Io level in central 6 resource blocks. The Io1 and Io2 have the same range as defined for Io.
- 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.

9.1.5A 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 | 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 | |
| | ±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 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 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 | Evtromo | | lo Note 1 range | | | |
| 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 | ≥-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 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 | | | 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 | ±4 | ≥-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 | ±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, 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.

Note 4

Note 4

±3.5

±4

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

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 4

- 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 Io 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.

≥-6 dB

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 | ıracy | | | 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 lo |
| dB | dB | dB | dB | | dBm/15kHz | dBm/BW _{Channel} |
| | | | | FDD_A, TDD_A | -121 | -50 |
| | | | 0 ≤lo1- lo2 | FDD_B | -120.5 | -50 |
| | | | | FDD_C, TDD_C | -120 | -50 |
| | | | | FDD_D | -119.5 | -50 |
| ±3 | ±4 | ≥-3 dB | | FDD_E, TDD_E | -119 | -50 |
| | | | | FDD_F | -118.5 | -50 |
| | | | | FDD_G | -118 | -50 |
| | | | | FDD_H | -117.5 | -50 |
| | | | <u> </u> | 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 £s/lot is the minimum £s/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 Io | |
| dB | dB | dB | | dBm/15kHz Note 3 | dBm/BW _{Channel} | |
| | | | FDD_A, TDD_A | -121 | -50 | |
| | ±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 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

-50

Note 3

-114.5

Note 3

±5.0

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

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.

≥-6 dB

- 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 Io | | | | | |
| Ts Note 2 | dB | MHz | | dBm/15kHz Note 5 | dBm/BW _{Channel} | | | | | |
| | | | FDD_A, TDD_A | -121 | -50 | | | | | |
| | | ≥1.4 MHz | FDD_B | -120.5 | -50 | | | | | |
| | ≥-3 dB | | 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 | $4104 \le T_{UE Rx-Tx} < 4112$ | 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 ≤ THE 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 MHz | FDD_A, TDD_A | -121 | -50 | | |
| | | | FDD_B | -120.5 | -50 | | |
| | | | FDD_C, TDD_C | -120 | -50 | | |
| | | | FDD_D | -119.5 | -50 | | |
| ±20 | ≥-3 dB | | 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 transmission bandwidth of PCell | lo range Note 5 | | | | | |
| Accuracy | CRS Ês/lot Note 6 | | 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} | | | |
| | | ≤ 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 | ≥-7.76 | | 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 lo 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 Io is defined in PRS positioning subframes. The same Io range applies to PRS and non-PRS symbols. Io 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 | | | | | | | | | |
|-----------|--|--|--|--|--|--|--|--|--|--|
| Accuracy | PRS Ês/lot | Minimum PRS bandwidth which is minimum of serving cell channel bandwidth 7 and the PRS | Minimum number of available measurement subframes among the | | Minimum Io Note 1 | Maximum | | | | |
| | dB | bandwidths of the reference cell and the measured neighbour cell i | | band groups | dBm/15kHz | lo dBm/BW _{Chan} | | | | |
| Ts Note 2 | 45 | RB | | | Note 5 | nel | | | | |
| ±21 | (PRS Ês/lot) _{ref} ≥-6dB and (PRS Ês/lot) _i ≥-13dB | ≥ 6 | 4 | FDD_A, TDD_A FDD_B FDD_C, TDD_C FDD_D FDD_E, TDD_E FDD_F FDD_G FDD_H FDD_N | -121 -120.5 -120 -119.5 -119 -118.5 -118 -117.5 -114.5 | -50 -50 -50 -50 -50 -50 -50 -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 Io is defined in PRS positioning subframes. The same Io 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 | T_s |
| RSTD_6356 | 0 < RSTD ≤ 1 | Ts |
| RSTD_6357 | 1 < RSTD ≤ 2 | Ts |
| RSTD_6358 | 2 < RSTD ≤ 3 | T _s |
| | | |
| RSTD_10450 | 4094 < RSTD ≤ 4095 | Ts |
| RSTD_10451 | 4095 < RSTD ≤ 4096 | T _s |
| RSTD_10452 | 4096 < RSTD ≤ 4101 | Ts |
| RSTD_10453 | 4101 < RSTD ≤ 4106 | T _s |
| | | |
| RSTD_12709 | 15381 < RSTD ≤ 15386 | T _s |
| RSTD_12710 | 15386 < RSTD ≤ 15391 | Ts |
| RSTD_12711 | 15391 < RSTD | Ts |

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 condition | | | lo Note 1 range | | | | |
| | | Ês/lot | E-UTRA operating band groups Note 3 | Minin | Minimum Io | | |
| 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 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

| Accı | ıracy | | Condition | | | | |
|-----------|-----------|-------------|-------------------------------------|------------------|---------------------------|--|--|
| Normal | Extreme | Ês/lot Note | lo Note 1 range | | | | |
| condition | condition | ES/10t | E-UTRA operating band groups Note 5 | Minimum Io | Maximum Io | | |
| dB | dB | dB | | dBm/15kHz Note 4 | dBm/BW _{Channel} | | |
| | ±4 | | FDD_A, TDD_A | -121 | -50 | | |
| | | ≥-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 | ±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 | ≥-3 dB | FDD_B | -120.5 | -50 | | |
| | | | FDD_C, TDD_C | -120 | -50 | | |
| | | | FDD_D | -119.5 | -50 | | |
| ±3.5 | | | 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 | | |
| ±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

| Accı | ıracy | | | | | | |
|--------|--------------------------|--------|--|---------------------|---------------------------|---------------------------|--|
| Normal | Normal Extreme condition | | lo ^{Note 1} range | | | | |
| | | | E-UTRA operating band groups Note 3 | Minin | num lo | Maximum Io | |
| 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 | |
| | | ≥ 0 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 | ≥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 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

| Accı | 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 Io | |
| dB | dB | dB | | dBm/15kHz Note 4 | dBm/BW _{Channel} | |
| | | | FDD_A, TDD_A | -121 | -50 | |
| | ±3 | ≥0 dB | FDD_B | -120.5 | -50 | |
| | | | FDD_C, TDD_C | -120 | -50 | |
| | | | FDD_D | -119.5 | -50 | |
| ±2 | | | 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

| Accuracy | | 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 | dBm/BW _{Channel} | dBm/BW _{Channel} | |
| | | | FDD_A, TDD_A | -121 | N/A | -70 | |
| | | | FDD_B | -120.5 | N/A | -70 | |
| | | ≥0 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 | ≥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

| Accı | ıracy | Conditions | | | | | |
|------------------|-------------------|---------------|-------------------------------------|------------------|--|--|--|
| Name Fytrems | | CSI | lo Note 1 range | | | | |
| Normal condition | Extreme condition | Ês/lot Note 2 | E-UTRA operating band groups Note 4 | Minimum 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 | | |
| ±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 | | |
| | l | | בטט או | 1115 | -50 -50 -50 -50 -50 -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 | Accuracy | | Conditions | | | | |
|--------------------------|----------|--------|-------------------------------------|------------------|--|--|--|
| Normal | Evtromo | | lo Note 1 range | | | | |
| Normal Extreme 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 | | |
| | | | FDD_C, TDD_C | -120 | -50 -50 | | |
| | | | FDD_D | -119.5 | -50 | | |
| ±TBD | ±TBD | ≥-3 dB | FDD_E, TDD_E | -119 | dBm/BW _{Channe} -50 -50 | | |
| TIBD | ΣΙΒυ | ≥-3 UD | FDD_F | -118.5 | | | |
| | | | 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 on the same frequency as that of 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

| Accı | Accuracy | | Conditions | | | | |
|------------------|-------------------|--------|-------------------------------------|------------------|---|--|--|
| Normal Estromo | | | 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 | | |
| | | | FDD_C, TDD_C | -120 | -50 | | |
| | | | FDD_D | -119.5 | -50 | | |
| ±TBD | +TBD | ≥-3 dB | FDD_E, TDD_E | -119 | -50 -50 -50 -50 -50 -50 -50 | | |
| TIDD | ΣΙΒυ | ≥-3 UD | FDD_F | -118.5 | | | |
| | | | FDD_G | -118 | -50 | | |
| | | | FDD_H | -117.5 | -50 | | |
| | | Ï | 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 | condition | ES/IOT | E-UTRA operating band groups Note 5 | Minimum Io | | |
| dB | dB | dB | | dBm/15kHz Note 4 | dBm/BW _{Channel} | |
| | | | FDD_A, TDD_A | -121 | -50 | |
| | | | FDD_C, TDD_C | -121 -50 -120 -50 -119.5 -50 | | |
| | | | FDD_D | -119.5 | -119.5 -50 -119 -50 | |
| ±TBD | ±TBD | ≥-3 dB | FDD_E, TDD_E | -119 | | |
| TIDD | ΣΙΒυ | ≥-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 requirements

 NOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].

 Editor's node: requirements are TBD.
- 9.1.18.2.4 Intra-frequency absolute RSRP measurement accuracy requirementsNOTE: These requirements are applicable only for CA under operation with frame structure 3 [16].Editor's node: requirements are TBD.
- 9.1.18.2.5 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]. Editor's node: requirements are TBD.

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]. Editor's node: requirements are TBD.

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.

| Accı | ıracy | Conditions | | | |
|------------------|-----------|-------------------------------------|------------------|---------------------------|--|
| Normal condition | Extreme | Io Note 1 range | | | |
| | condition | E-UTRA operating band groups Note 4 | Minimum Io | Maximum Io | |
| dB | dB | | dBm/15kHz Note 3 | dBm/BW _{Channel} | |
| | | FDD_A, TDD_A | -121 | -50 | |
| | | FDD_C, TDD_C | -120 | -50 | |
| | | FDD_D | -119.5 | -50 | |
| [10.5] | [E E] | FDD_E, TDD_E | -119 | -50 | |
| [±2.5] | [±5.5] | FDD_F | -118.5 | -50 | |
| | | FDD_G | -118 | -50 | |
| | | FDD_H | -117.5 | -50 | |
| | | FDD_N | -114.5 | -50 | |
| [±4.5] | [±7.5] | Note 2 | Note 2 | Note 2 | |

Table 9.1.18.5.2-1: Intra-frequency RSSI accuracy

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

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.

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.

9.1.19.3 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} | | | |
| | | | FDD_A, TDD_A | -121 | -50 | | | |
| | | | FDD_C, TDD_C | -120 | -50 | | | |
| | | | FDD_D | -119.5 | -50 | | | |
| [TBD] | ≥-3 dB | ≥1.4 MHz | FDD_E, TDD_E | -119 | -50 | | | |
| נטסון | ≥-3 UD | 21.4 WITZ | FDD_F | -118.5 | -50 | | | |
| | | | FDD_G Note 4 | -118 | -50 | | | |
| | | | FDD_H | -117.5 | -50 | | | |
| | | | FDD_N | -114.5 | -50 | | | |
| [TBD] | ≥-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.

9.1.20.2 SSTD Measurement Report Mapping

SFN and subframe timing difference (SSTD) measurement report comprises 3 elements:

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.

 T_s

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.

Reported Value **Measured Quantity Value** Unit SUBFRAME_BOUNDARY_OFFSET_00 $abs(\Delta Z) \leq 700$ T, SUBFRAME BOUNDARY_OFFSET_01 $700 < abs(\Delta Z) \le 710$ T. SUBFRAME BOUNDARY OFFSET 02 $710 < abs(\Delta Z) \le 720$ T_s SUBFRAME BOUNDARY_OFFSET_61 1300 < abs(Δ Z) ≤ 1310 Ts SUBFRAME_BOUNDARY_OFFSET_62 1310 < abs(Δ Z) ≤ 1320 T_s SUBFRAME_BOUNDARY_OFFSET_63

Table 9.1.20.2-1: SSTD report mapping

 $1320 < abs(\Delta Z)$

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.

921 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 | ange | | |
| 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 | ±9 | 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 IEEE802.11 Beacon RSSI

NOTE: This measurement is for access network selection and traffic steering between E-UTRAN and IEEE802.11.

The requirements in this clause are valid for terminals supporting this capability.

IEEE802.11 Beacon RSSI defined in sub-clause 5.1.16 of [4] shall meet the performance requirement defined in [32].

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

| Accuracy | | Conditions | | | | |
|-----------|-----------|------------|--|---------------------|---------------------------|---------------------------|
| Normal | Extreme | | lo Note 1 range | | | |
| condition | condition | Ês/lot | E-UTRA operating band Minir groups Note 3 | | 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 |
| | | ≥-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.

9.8.2.2 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

| Accuracy | | | Conditions | | | |
|-----------|---------------------------------|--------------|-------------------------------------|------------------|---------------------------|--|
| | | | Io Note 1 range | | | |
| condition | Normal Extreme condition Es/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 | |
| | | FDD_B | -120.5 | -50 | | |
| | | FDD_C, TDD_C | -120 | -50 | | |
| | FDD_D | -119.5 | -50 | | | |
| ±2.5 | ±2.5 ±4 ≥-3 dB | 4 ≥-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 | <u>±</u> 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.

9.8.3.2 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.

Table 9.8.4.1-1: MCH BLER measurement report mapping

| 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≤ MCH 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 | % |

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 | $0 \leq N_R < 256$ |
| 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≤ 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) |

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 | -117 - 96 |

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 | $4092 \le T_{ADV} < 4094$ | Ts |
| 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 in any cell selection state . The ProSe requirements shall apply provided that the sidelink used by the UE for ProSe Direct Communication is on the carrier that is preconfigured in the ProSe UE for out-of-coverage operation.

Note: Any cell selection state refers to a UE that is out of network coverage.

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 regarding transmit timing in any cell selection state.

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 | link Bandwidth (MHz) | T _e |
|--|----------------------|-------------------|
| | ≥1.4 | 24*T _S |
| Note: T _S is the basic timing unit 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 evaluate it to initiate/cease SLSS transmissions within $T_{evaluate,SLSS} = 0.8$ 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:

- 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 in any cell selection state.

The UE can be preconfigured with ProSe resources for ProSe operation in any cell selection state.

The requirements in this section are applicable for the ProSe in any cell selection state. The ProSe UE in any cell selection state shall:

- continuously search for any detectable E-UTRA cell on the donwlink carrier frequency associated with the preconfigured ProSe carrier frequency for ProSe operation in any cell selection state, and
- search cells also on other carriers and perform cell selection according to the procedure specified in section 4.1.

11.4.2 Requirements

The UE capable of ProSe Direct Communication immediately upon entering in any cell selection state shall search for any detectable cell on the carrier preconfigured with ProSe resources.

In any cell selection state the UE shall be able to identify a newly detectable E-UTRA 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.

11.5 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 in any cell selection state.

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 in any cell selection state.

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 11.6 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 transmissions at the physical layer for the purpose of SyncRef UE selection / reselection.

The UE capable of ProSe Direct Communication 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 Measurements Performance Requirements for ProSe in Any Cell Selection State

11.6.1 Introduction

The requirements in this clause are applicable for a UE capable of ProSe direct communication:

- in Any Cell Selection State,
- that is synchronised to the ProSe synchronization source 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:

- 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.

11.6.2 Intra-Frequency S-RSRP Measurement Accuracy Requirements

11.6.2.1 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 11.5.2.1-1 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 11.6.2.1-1: Intra-frequency S-RSRP absolute accuracy for UE capable of ProSe Direct Communication

| Accı | uracy | | Conditions | | | | | | | | | | | | | |
|-----------|---------|--------|---|---------------------|---------------------------|---------------------------|--------|--------|--------|-------|--------|-----|-----|--|--|--|
| Normal | Extreme | Ês/lot | Io Note 1 range | | | | | | | | | | | | | |
| condition | Nata | | E-UTRA ProSe operating band groups Note 3 | Minin | 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 | ≥-6 dB | ≥-6 dB | ≥-6 dB | ≥-6 dB | ≥-6 dB | ≥-6 dB | ≥-6 dB | ≥-6 dB | FDD_F | -118.5 | N/A | -70 | | | |
| | | | | | | | | | | ſ | ſ | | | | | |
| | | | FDD_N | -114.5 | N/A | -70 | | | | | | | | | | |
| ±8 | ±11 | ≥-6 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: Ês/lot for a SyncRef UE is the minimum of the Ês/lot of PSSS/PSBCH and the Ês/lot of SSSS

11.6.2.2 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 11.5.2.2-1 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 11.6.2.2-1: S-RSRP Intra frequency relative accuracy for UE capable of ProSe direct communication

| Accı | ıracy | | Conditions | | | | | | |
|-----------|-----------|-------------|---|------------------|---------------------------|--|--|--|--|
| Normal | Extreme | Êc/lot Note | lo ^{Note 1} range | | | | | | |
| condition | condition | Ês/lot Note | E-UTRA ProSe operating band groups Note 5 | Minimum Io | Maximum Io | | | | |
| dB | dB | dB | | dBm/15kHz Note 4 | dBm/BW _{Channel} | | | | |
| | | | FDD_D | -119.5 | -50 | | | | |
| | | | FDD_E | -119 | -50 | | | | |
| ±2 | ±3 | ≥-3 dB | 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 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: Ês/lot for a SyncRef UE is the minimum of the Ês/lot of PSSS/PSBCH and the Ês/lot of SSSS

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. +/-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 +/-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: 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 | Value | | | | | | |
|---|------|-------|---|---|-------|----|----|--|
| 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 | Va | lue |
|---|------|----------|----------|
| 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 | | | | Valu | ue | | | |
|-----------------------------------|---------|----------|--------|--------|--------|--------|--------|--------|--------|
| 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 |
| | trol region co | | | ICH and F | DCCH. | | | | |
| Note 2: DCI form | nats are defir | ned in TS 36. | .212. | | | | | | |
| | nat shall depe | | | | | | | | |
| | hall depend | | | | | | | | |
| | size shall de | | | | | | | | |
| | 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] | | | | | | | |
|---------------|-----|--|------|----------|--------|--------|--|--|--|
| $n_{\it PRB}$ | | Subfr | rame | | Data | Data | | | |
| | 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 | 110101 | 14/7 | | | |
| 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 | 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 | Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB] | | | | PDSCH Data | PMCH Data |
|---------------|---|----------|-----|----------|---------------|--------------|
| $n_{\it PRB}$ | | 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 | Note | IN/A |
| | | Ů | ŭ | 1471 | | |
| 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 | PDSCH Data | PMCH Data | | | | |
|---------------|-----|---------------|--------------|--------------|--------|--------|--|
| $n_{\it PRB}$ | | Subframe | | | | | |
| | 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

PDSCH

N/A:

Allocation

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

| Alloc | | Re | В] | PDSCH Data | | |
|---------|----------------------------------|---|---|---|--------------------------------------|----------|
| n_P | RB | | Subframe | (Note 1) | | |
| | | 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: | | cation of any Pl | | | pplies only to | the |
| Note 2: | These p | es not configure hysical resourc Es with one PD PDSCHs shall b | e blocks are as SCH per virtua | ssigned to an a al UE; the data | a transmitted o | ver the |
| Note 3: | PDSCH If two or part of C | more transmit a | antennas with ransmitted to t | CRS are used the virtual user | in the test, the s by all the tra | PDSCH |
| | The para transmit transmit | s with CRS and ameter γ_{PRB} appower of the Pantennas with are specified in | oplies to each a DSCH part of CRS used in the | antenna port s OCNG is equa ne test. The ar | eparately, so t Il between all t | he he |

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

| Alloc | Allocation Relative power level γ_{PRB} [dB] | | | | | | | |
|---------|--|---|---|-------------------------|-----------------|-----------|--|--|
| 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: | | cation of any Pl | | | pplies 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 DCNG PDSCHs shall be uncorrelated pseudo random data, which is | | | | | | |
| | QPSK m | nodulated. The | parameter $\gamma_{\scriptscriptstyle I}$ | p_{RB} is used to s | scale the powe | r of | | |
| Note 3: | PDSCH | more transmit a part of OCNG s antennas with | shall be transn | nitted to the vir | tual users by a | all the | | |
| | 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 separated the transmit power of the PDSCH part of OCNG is equal between all transmit antennas with CRS used in the test. The antenna transmissi modes are specified in clause 7.1 in TS 36.213. Not Applicable | | | | | | | |

PDSCH

Data

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 | B] | PDSCH Data | | | | |
|--------------------|---------------------------------|--|----------------------------|-------------------|-----------------|-----------|--|--|
| n_{P} | RB | | Subframe | (Note 1) | | Data | | |
| | | 0 | 5 | 4, 9 | 1 - 3, 6 - 8 | | | |
| | | | | | | | | |
| 0 – | | 0 | 0 | 0 | 0 | Note 2 | | |
| Note 1: Note 2: | subfram These p virtual U | 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 DCNG PDSCHs shall be uncorrelated pseudo random data, which is | | | | | | |
| N. C | PDSCH. | | , , | ND | | | | |
| Note 3: | PDSCH | more transmit a part of OCNG s antennas with | shall be transm | nitted to the vir | tual users by a | all the | | |
| | mode 2. | The parameter | $\gamma_{\it PRB}$ applies | to each anten | na port separa | ately, so | | |
| N/A: | transmit | smit power of th antennas with o are specified in o licable | CRS used in th | ne test. The ar | | | | |

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)

4,9 (1-3, 6-8)^{Note2}

| | | | · · | 1,0 | (10,00) | | | |
|---|---|--|--|---|---|--------------------------------------|--|--|
| 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: PDSCH allocation does not apply to subframes configured as PRS subframes. | | | | | | | | |
| Note 2: | virtual Ü OCNG F | Es with one F PDSCHs shall | PDSCH per vir be uncorrelat | tual ŬE; the o | an arbitrary numb data transmitted o andom data, which to scale the power | ver the n is | | |
| Note 3: | PDSCH If two or part of C | more transm CNG shall be | it antennas wit transmitted to | h CRS are u o the virtual ւ | sed in the test, the users by all the tra a transmission mo | e PDSCH Insmit | | |
| Note 4: | transmit transmit modes a The sub PMCH o slot. The | power of the antennas with are specified if frame(s) conflata and shall be subframe(s) | PDSCH part of the CRS used in clause 7.1 in igured as MBS contain CRS of | of OCNG is end the test. The TS 36.213. SFN ABS in a conly in the fir MBSFN ABS | ort separately, so to qual between all to e antenna transmi a test shall not con st symbol of the fi S depend upon the | he ssion ntain any rst time | | |

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: Note 2: | subfram These p virtual U | PDSCH allocation applies only to 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 | more transmi part of OCNG antennas with | t antennas w S shall be train CRS and a | with CRS are us ensmitted to the eccording to the | o scale the power sed in the test, the e virtual users by a e antenna transmi tenna port separa | e all the ission | | | |
| Note 4: | the trans transmit modes a The sub PMCH o slot. The | smit power of antennas with are specified in frame(s) confilata and shall e subframe(s) ABS pattern of | the PDSCH process the PDSCH process that the | part of OCNG in the test. The in TS 36.213. ISFN ABS in a conly in the firs S MBSFN ABS | is equal between antenna transmin test shall not corest symbol of the first depend upon the | all the ission ntain any rst time | | | |

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 | NOIE Z | |
| Note 1: | The | allocation of a | ny PDSCH wit | h or without S | IB1 applies on | ly to the subframes | |
| | not | configured as F | PRS subframe | S. | | | |
| Note 2: | | | | | | number of virtual | |
| | UE: | s with one PDS | CH per virtual | UE; the data t | ransmitted over | er the OCNG | |
| | PD | SCHs shall be u | uncorrelated p | seudo random | data, which is | QPSK modulated. | |
| Note 3: | If tw | OCNG shall be | smit antennas transmitted to | with CRS are the virtual use | used in the tears rs by all the tra | st, the PDSCH part ansmit antennas . The parameter | |
| N/A: | γ_P PD: in the | th CRS and according to the antenna transmission mode 2. The parameter applies to each antenna port separately, so the transmit power of the DSCH 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 3.36.213. | | | | | |
| IN/A: | IOVI | 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

| Allocation | Re | lative power I | B] | PDSCH Data | PMCH Data | |
|---------------|-----|----------------|-----|---------------|--------------|--------|
| $n_{\it PRB}$ | | Subfr | | Dutu | Dutu | |
| | 0 | 5 | 4,9 | 1-3, 6-8 | | |
| 0 – 37 | 0 | 0 | 0 | N/A | Note 1 | N/A |
| 62 – 99 | 0 | 0 | 0 | N/A | Note | 14/73 |
| 0-99 | 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

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

| Alloc | | Re | lative power l | evel $\gamma_{\it PRB}$ [d | B] | PDSCH Data | PMCH Data |
|---------|---|--|---|--|-------------------------------|--------------------------|----------------|
| n_{P} | PRB | | | Data | Data | | |
| | | 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: | 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 | | | | | | |
| Note 2: | Each ph each PR measure | used to scale the specifical resource RB shall be uncomment. The MBS 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 publicated. PMCI | period of and subframe | ny es shall |
| Note 3: | If two or | ameter γ_{PRB} is a more transmit a shall be transmit | antennas with | CRS are used | in the test, the | | |
| | and acc | ording to the an | tenna transmi | ssion mode 2. | The paramete | er $\gamma_{_{PRB}}$ app | olies to |
| | equal be | tenna port sepa etween all the tr ssion modes are | ansmit antenn | as with CRS u | sed in the test | . The anter | |

0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A:

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

| Alloca | Allocation Relative power level γ_{PRB} [dB] | | | | | | |
|--------------------|---|--|---|--|---|---------------------------|--|
| n_P | RB | | 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 | cation of any Ples not configure hysical resource Es with one PDSCHs shall be nodulated. The | ed as PRS sub e blocks are as SCH per virtus se 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 | more transmit a part of OCNG s antennas with | shall be transn | nitted to the vir | tual users by | all the | |
| | the trans transmit | The parameter smit power of the antennas with are specified in | ie PDSCH par CRS used in tl | t of OCNG is ϵ he test. The ar | equal between ntenna transmi | all the | |

A.3.2.1.14 OCNG FDD pattern 14: full bandwidth allocation in 20 MHz (without MBSFN)

Table A.3.2.1.14-1: OP.14 FDD: OCNG FDD Pattern 14

| Alloca | ation | Re | B] | PDSCH Data | | | | | |
|--------------------|---------------------------------|---|---|-------------------------|-----------------|-----------|--|--|--|
| n_{P} | RB | | Subframe | (Note 1) | | Dala | | | |
| | | 0 | 5 | 4, 9 | 1 - 3, 6 - 8 | | | | |
| 0 – | 99 | 0 | 0 | 0 | 0 | Note 2 | | | |
| Note 1: Note 2: | subfram These p virtual U | ne allocation of any PDSCH with or without SIB1 applies only to the ubframes not configured as PRS subframes. nese physical resource blocks are assigned to an arbitrary number of rtual UEs with one PDSCH per virtual UE; the data transmitted over the CNG PDSCHs shall be uncorrelated pseudo random data, which is | | | | | | | |
| | QPSK m | nodulated. The I | parameter $\gamma_{\scriptscriptstyle F}$ | p_{RB} is used to s | scale the powe | er of | | | |
| Note 3: | If two or PDSCH | more transmit a part of OCNG s antennas with | shall be transm | nitted to the vir | tual users by a | all the | | | |
| | mode 2. | The parameter | $\gamma_{\it PRB}$ applies | to each anten | na port separa | ately, so | | | |
| N/A: | transmit | smit power of th antennas with or are specified in s licable | CRS used in th | ne test. The ar | ntenna transmi | | | | |

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 | Relative power level $\gamma_{\it PRB}$ [dB] | | | | |
|---------------|-----|--|-----|----------|--------|--------|
| $n_{\it PRB}$ | | Subfr | | Data | Data | |
| | 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 | evel $\gamma_{\it PRB}$ [d | B] | PDSCH Data | PMCH Data |
|---------------|----|----------------|----------------------------|--------------|---------------|--------------|
| $n_{\it PRB}$ | | Data | Data | | | |
| | 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: | | hysical resource | | | | | | |
| | 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 | | | | | | | |
| | | used to scale th | | | r moddiatod. | rno param | 0.01 | |
| 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 para | ameter $\gamma_{\it PRB}$ is (| used to scale t | he power of P | MCH. | | | |
| Note 3: | | more transmit a | | | | | | |
| | and acco | 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 sion modes are 1 transmit anter | ansmit antenn 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 Relative power level γ_{PRB} [dB] | | | | | 3] | PDSCH Data | |
|---|---|-----------------|----------------|--------------|----------------|---------------------|--|
| $n_{\it PRB}$ | n _{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 | |
| | | | | | 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

OCNG FDD pattern 18: outer resource blocks allocation in 5 MHz (without A.3.2.1.18 MBSFN)

Table A.3.2.1.18-1: OP.18 FDD: OCNG FDD Pattern 18

| Alloc | | Re | B] | PDSCH Data | | |
|--------------------|---|--|--|--|---|---------------------------|
| n_P | RB | | Subframe | (Note 1) | | Data |
| | | 0 | 5 | 4,9 | 1-3, 6-8 | |
| 0 - | - 6 | 0 | 0 | 0 | N/A | |
| 18 – | - 24 | 0 | 0 | 0 | N/A | Note 2 |
| 0 – | 24 | 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 resource IEs with one PEPDSCHs shall be | ed as PRS sub e blocks are as OSCH per virtus be uncorrelated | oframes. ssigned to an a al UE; the data d pseudo rando | arbitrary numb a transmitted com data, which | er of over the n is |
| Note 3: | PDSCH If two or PDSCH | nodulated. The more transmit part of OCNG antennas with | antennas with shall be transn | CRS are used | in the test, the tual users by | e all the |
| | the trans transmit | The parameter smit power of the antennas with are specified in | ne PDSCH par CRS used in tl | t of OCNG is e he test. The ar | equal between ntenna transm | all the |

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

| | Relative power level γ_{PRB} [dB] | | | | | | |
|---------|---|---|---|---------------------------|-----------------|-----------|--|
| n_P | RB | | Data | | | | |
| | | 0 | 4, 9 | 1 - 3, 6 - 8 | | | |
| 0 – | 24 | 0 | 0 | 0 | 0 | Note 2 | |
| Note 1: | | cation of any PI | | | pplies only to | the | |
| Note 2: | 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 | | | | | | |
| | | nodulated. The | parameter $\gamma_{\scriptscriptstyle I}$ | $ ho_{RB}$ is used to s | scale the powe | er of | |
| Note 3: | PDSCH | more transmit a part of OCNG santennas with | shall be transn | nitted to the vir | tual users by a | all the | |
| | mode 2. | The parameter | $\gamma_{\it PRB}$ applies | to each anten | na port separa | ately, 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 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 | | Rel | ative power le | 3] | PDSCH Data | | |
|---|---|-------------|----------------|----------|--------------|--------|--|
| $n_{\it PRB}$ | | | Subframe | (Note 1) | | | |
| | | 0 | 5 | 4, 9 | 1 - 3, 6 - 8 | | |
| 0 - 6 | | 0 | 0 | 0 | 0 | Note 2 | |
| 18 - 24 | 1 | 0 | 0 | 0 | 0 | NOIG Z | |
| 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. | | | | | | |
| Note 3: | 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 3GPF 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 | | PDSCH Data | | | |
|---------------|---|------------|---|-------------------------------------|--------|
| $n_{\it PRB}$ | | Subframe (| Note 1) | | |
| | 0 | 5 | 3 , 4, 8, 9 and 6 (as normal subframe) Note 3 | 1 and 6 (as special subframe) | |
| 0 – 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 $\gamma_{\scriptscriptstyle PRB}$ [dB] | | | | | | | |
|--------------------|------------|---|-------------|--------------|-------------|-------------|-----|------------|-------------|
| $n_{\it PRB}$ | | | Sı | oecial sub | frame cor | nfiguration | 1 | | |
| | 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 | \searrow | \setminus |
| 37 – 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 – 49 | U | U | U | U | U | U | U | > < | $>\!\!<$ |
| Note 1: Special su | bframe con | figurations | are defined | l in Table 4 | 1.2-1 in TS | 36.211 [10 | 6]. | | |

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) | | | | |

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| (|) – 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 $\gamma_{\scriptscriptstyle PR}$ | $_{_{\mathrm{S}}}$ is used to scale the p | 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: | • • | | | | | | | |
| | 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 | | PDSCH Data | | | | | | |
|---------------|---|-------------------|--|-------------------------------------|--------|--|--|--|
| $n_{\it PRB}$ | | 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 $\gamma_{\it PRB}$ [dB] | | | | | | |
|---------------|---|--|--|-------------------------------------|--|--|--|--|
| $n_{\it PRB}$ | | | | | | | | |
| | 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 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: | | | | n the test, the OCNG s rding to the antenna tra | | | | | |
| | | TLD | | ely, so the transmit po | | | | | |

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] | | | | | | | | |
|---------------|---|---|---|-------------------------------------|--------|--|--|--|--|--|
| $n_{\it PRB}$ | | Subframe (| Note 1) | | | | | | | |
| | 0 | 5 | 3 , 4, 8, 9 and 6 (as normal subframe) Note 3 | 1 and 6 (as special subframe) | | | | | | |
| 0 – 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 | 0 | | |
| 37 - 49 | | U | 0 | 0 | U | U | 0 | > | | | |
| 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 γ_{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 le | vel $\gamma_{\it PRB}$ [dB] | | PDSCH Data |
|---------------|---|-------------------|---|-------------------------------------|------------|
| $n_{\it PRB}$ | | 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 | (| 3 | 7 | 7 | 8 | 3 |
| | <u>გ</u> | | | | | | C | ontro | ol reg | jion (| OFDN | 1 sym | nbols | | | | | | |
| | | 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 | | n | ١., | Λ | | n | | Λ | ١., | 0 | | 1 | (|) | (|) |
| 02 – 99 | | , | 0 | ' | 0 | | U | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | <u> </u> | | U | | 0 | , | , | > | < | \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 $\gamma_{\it PRB}$ [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) 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 | | PDSCH Data | | | |
|------------|---|---------------|---|--|--------|
| n_{PRB} | | Subfr | ame (Note 1) | | |
| | 0 | 5 | 3 , 4, 8, 9 and 6 (as normal subframe) Note 3 | 1 and 6 (as special subframe) Note 3 | |
| 0 – 6 | 0 | 0 | 0 | Table A.3.2.1.7- | Note 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 | ج | | 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> </u> | | | С | ontrol reg | ion OFDN | l 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 - 6 | | U | U | U | U | U | U | U | $>\!\!<$ | $>\!\!<$ | | |
| 18 – 24 | N | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 10 - 24 | | U | U | U | U | U | U | 0 | $>\!\!<$ | $>\!\!<$ | | |
| Note 1: Specia | l 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

| Allocation | on | | Relative p | ower level $\gamma_{{\scriptscriptstyle PRB}}$ [dB] | | PDSCH Data | | |
|---|-----|---------------|------------|--|----------------------------------|---------------|--|--|
| $n_{\it PRB}$ | | | | Data | | | | |
| | | 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 | | |
| 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 | | | | | | | | |
| Note 3: | pov | ver of PDSCH. | | K modulated. The para | , TRD | | | |

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 years by all the transmit antennas with CRS and according to the entennas.

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 cla | use 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 | E, [dB] |
|-------------------------|----------------------|----------------|----------|
| Channels and Signals | | Non-ABS | ABS |
| PBCH | PBCH_RA | 0 | 0 |
| РВСП | 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 |
| PRICE | PHICH_RB | 0 | -Inf |
| PDCCH | PDCCH_RA | 0 | 0 Note 1 |
| РИССП | PDCCH_RB | 0 | 0 Note 1 |
| DDCCII | PDSCH_RA | 0 | 0 Note 1 |
| PDSCH | PDSCH_RB | 0 | 0 Note 1 |
| OCNC | OCNG_RA | 0 | -Inf |
| OCNG | OCNG_RB | 0 | -Inf |
| NOTE 1: Only used | d for SIB1, otherwis | se EPRE is –In | ıf |

NOTE 1. Only used for SIBT, otherwise EPRE is –Init 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 | E, [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 |
| РИЗСП | PDSCH_RB | -3 | -Inf |
| OCNG | OCNG_RA | -3 | -Inf |
| OCING | OCNG_RB | -3 | -Inf |
| NOTE: 2x2 anten | na configuration is | assumed | |

Table A.3.4.1.2-2: Transmission configuration #2 with non-MBSFN ABS, 2x2 without PBCH

| Physical | | EPRE | E, [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 |
| РОЗСП | PDSCH_RB | -3 | -Inf |
| OCNG | OCNG_RA | -3 | -Inf |
| OCING | OCNG_RB | -3 | -Inf |
| NOTE: 2x2 anteni | na 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 | | EPRI | E, [dB] |
|-------------------------|----------------------|---------|---------|
| Channels and Signals | Parameters | Non-ABS | ABS |
| PBCH | 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 |
| DUIOU | PHICH_RA | 0 | -Inf |
| PHICH | PHICH_RB | 0 | -Inf |
| DDCCII | PDCCH_RA | 0 | -Inf |
| PDCCH | PDCCH_RB | 0 | -Inf |
| DDCCII | PDSCH_RA | 0 | -Inf |
| PDSCH | PDSCH_RB | 0 | -Inf |
| PMCH | PMCH_RA | 0 | -Inf |
| PIVICH | PMCH_RB | 0 | -Inf |
| OCNC | OCNG_RA | 0 | -Inf |
| OCNG | OCNG_RB | 0 | -Inf |
| NOTE: 1x2 anter | nna 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 | E, [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 |
| PDCCH | PDCCH_RA | 1 | -Inf |
| PDCCH | PDCCH_RB | 1 | -Inf |
| PDSCH | PDSCH_RA | -3 | -Inf |
| PDSCH | PDSCH_RB | -3 | -Inf |
| DMCH | PMCH_RA | -3 | -Inf |
| PMCH | PMCH_RB | -3 | -Inf |
| OCNG | OCNG_RA | -3 | -Inf |
| OCING | OCNG_RB | -3 | -Inf |
| NOTE: 2x2 anten | na 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 | |
| PHICH | PHICH_RA | -3 | -Inf | |
| PHICH | PHICH_RB | -3 | -Inf | |
| PDCCH | PDCCH_RA | -3 | -Inf | |
| PDCCH | PDCCH_RB | -3 | -Inf | |
| PDSCH | PDSCH_RA | -3 | -Inf | |
| РИЗСП | PDSCH_RB | -3 | -Inf | |
| PMCH | PMCH_RA | -3 | -Inf | |
| FIVICH | PMCH_RB | -3 | -Inf | |
| OCNIC | OCNG_RA | -3 | -Inf | |
| OCNG | OCNG_RB | -3 | -Inf | |
| NOTE: 2x2 anten | na 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, 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 bandiwdths.

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 000000 |
| | 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 | | 1000000 0000000 0000000 0000000 0000000 |
| | txParameters | txParametersGeneral | alpha | al0 |
| | | | p0 | 31 |
| | | ue- SelectedResourceConfig | poolSelection | random |
| | | | txProbability | p100 |
| | rxParameters | | | not present |
| discTxPowerInfo | discMaxTxPower | | | 23 |
| SL-SyncConfig | syncCP-Len | | | Normal |
| | syncOffsetIndicator | | | 155 |
| | 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)

| | Information 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 000000 |
| | txParameters | | not present |
| | rxParameters | tdd-Config | not present |
| | | syncConfigIndex | 0 |
| discTxPoolCommon | | | not present |
| discTxPowerInfo | discMaxTxPower | | 23 |
| SL-SyncConfig | syncCP-Len | | Normal |
| | syncOffsetIndicator | | 140 |
| | 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)

| | 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 | | 163 |
| | | subframeBitmap | | 11000000 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 00000 |
| | txParameters | txParametersGeneral | alpha | al0 |
| | | | p0 | 31 |
| | | ue- SelectedResourceConfig | poolSelection | random |
| | | | txProbability | p100 |
| | rxParameters | | | not present |
| discTxPowerInfo | discMaxTxPower | | | 23 |
| SL-SyncConfig | syncCP-Len | | | Normal |
| | syncOffsetIndicator | | | 158 |
| | slssid | | | 30 |
| | txParameters | txParametersGeneral | alpha | al0 |
| | | | p0 | 31 |
| | | syncTxThreshIC | | 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 | <u> </u> |
| | 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 0000000 | 0 0 0 |
| | data-CP-Len | | | Normal | |
| | dataHoppingConfig | hoppingParameter | | 0 | |
| | datarioppingcomig | numSubbands | | ns1 | |
| | | rb-Offset | | 0 | |
| | ue- SelectedResourceConfig | data-TF- ResourceConfig | prb-Num | 12 | 25 |
| | | J | prb-Start | 0 | 0 |
| | | | prb-End | 23 | 49 |
| | | | offsetIndicator | 0 | |
| | | | subframeBitmap | 0000000 1111111 1111111 1111111 1111111 | 1 1 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 | • |
| | | subframeBitmap | | 0001100 000000 000000 000000 000000 | 0 0 0 |
| | 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 1111111 | 1 1 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 (-110dBr 15kHz) | m / |
| | filterCoefficient | | | fc0 | |
| | syncRefMinHyst | | | dB0 | |
| | syncRefDiffHyst | | | dB0 | |
| preconfigComm | sc-CP-Len | | | Normal | |
| - 7 | sc-Period | | | sf40 | |
| | sc-TF-ResourceConfig | prb-Num | | 12 | 25 |
| | 9 | 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 | annel | | CC.1 FDD | CC.2 FDD | | | |
| Channel band | dwidth | MHz | 5 | 10 | | | |
| Allocated res | ource blocks | | 1 | 1 | | | |
| Subcarriers p | er resource block | | 12 | 12 | | | |
| DFT-OFDM S (see Note 1) | Symbols per subframe | | 11 | 11 | | | |
| Modulation | | | QPSK | QPSK | | | |
| Information B | it Payload | Bits | 41 | 43 | | | |
| | Frequency hopping flag | | 0 | | | | |
| | RB assignment | | Set as per PSSCH RB allocation specific in the test | | | | |
| Information | Time resource pattern (I _{TRP}) | | 0 (Note 2) | | | | |
| bits | Modulation and coding scheme | | Set as the PSSCH MCS specified in the test | | | | |
| | Timing advance indication | | 0 | | | | |
| | Group destination ID | | As set by higher layers | | | | |
| Transport blo | ck CRC | Bits | 16 | 16 | | | |
| Maximum nu | mber of HARQ transmissions | | 2 | 2 | | | |
| Binary Chann | 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 $N_{TRP} = 8$ (FDD) and $trpt$ -Subset = 001, $I_{TRP} = 0$ corresponds to a time repetition pattern of $(1,0,0,0,0,0,0,0)$ as per TS 36.213. | | | | | | |

Table A.3.12.7-1: PSSCH Reference Measurement Channels for FDD

| Parameter | Unit | Val | ue | | | |
|---|------|----------|----------|--|--|--|
| 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 | | 24 | 24 | | | |
| Maximum number of HARQ transmissions | | 3 | 3 | | | |
| Binary Channel Bits (see note) | Bits | 528 | 1056 | | | |
| NOTE1: PSDCH 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 | Configuration | | PCP.1.FDD | | | | |
|------------------------|---|-----------|---|--|--|--|-------------------------|
| | Channel BW | | 5 or 10 | | | | |
| Number of Active | Number of Active Sidelink UEs per sc-period | | lumber of Active Sidelink UEs per sc-period | | umber 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 | PSSCH RMC (defined in A.3.12.7) | | 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 | Sidelink UEs per Discovery | | 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 | | 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 | |
| | | | | |
| | t 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. |
| Т3 | | 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 | Т3 | T1 | T2 | T3 |
| E-UTRA RF Channel | | | 1 | | | 1 | |
| Number | | | | | | | |
| BW _{channel} | MHz | | 10 | | 10 | | |
| OCNG Patterns | | | | | | | |
| defined in A.3.2.1.2 | | C | P.2 FDD | | | OP.2 FDD |) |
| (OP.2 FDD) | | | | | | | |
| | | | | | | | |
| 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_ | | | RSRP | | | RSRP | |
| measurement | | | | | | | |
| \hat{E}_{s}/I_{ot} | dB | 16 | -3.11 | 2.79 | -infinity | 2.79 | -3.11 |
| | dBm/15 kHz | | | | 00 | | |
| $N_{oc}^{ m Note2}$ | 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 | | AWGN | | | | | |
| 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.

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:

 $T_{detect,EUTRAN_Intra}$ See Table 4.2.2.3-1 in clause 4.2.2.3

T_{evaluateFDD,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.

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 | | 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 B | 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 sul | 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. |
| T3 | | 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 | T3 | 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 | | OI | P.2 TDD | | |
| (OP.2 TDD) | | | | | | | | |
| PBCH_RA | | | | | | | | |
| PBCH_RB | | | | | | | | |
| PSS_RA | 1 | | | | | | | |
| SSS RA | 1 | | | | | | | |
| PCFICH_RB | 1 | | | | | | | |
| PHICH_RA | 1 | | | | | | | |
| PHICH_RB | dB | | 0 | | 0 | | | |
| PDCCH_RA | 1 | | • | | | • | | |
| PDCCH RB | • | | | | | | | |
| PDSCH_RA | • | | | | | | | |
| PDSCH_RB | • | | | | | | | |
| OCNG_RA ^{Note 1} | • | | | | | | | |
| OCNG_RB ^{Note 1} | † | | | | | | | |
| Qrxlevmin Qrxlevmin | dBm | | -140 | | -140 | | | |
| Pcompensation | dB | | 0 | | 0 | | | |
| Qhyst _s | dB | | 0 | | 0 | | | |
| Qoffset _{s, n} | dB | | 0 | | 0 | | | |
| Cell_selection_and_ | | | | | | | | |
| reselection_quality_ | | F | RSRP | | | RSRP | | |
| measurement | | | | | | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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 | N | ot sent | • | N | lot sent | | |
| Propagation | | | | ΑV | VGN | | | |
| Condition | | | | - •• | - | | | |
| | be used such that | both cells a | are fully a | allocated | and a cons | tant total | | |
| | power spectral den | | | | | | | |
| Note 2: Interference | | | | | | io occur | o d 4 o | |

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.4.2.2.2 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 | 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 | | 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 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 |
| Cell 1 E-U Number | TRA RF Channel | | 1 | One FDD carrier frequency is used. And Cell 1 is on RF channel number 1. |
| Cell 2 E-U Number | TRA RF Channel | | 2 | One TDD carrier frequencies is used. And Cell 2 is on RF channel number 2. |
| Time offse | t between cells | | 3 ms | Asynchronous cells |
| E-UTRA FDD PRACH configuration | | | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| E-UTRA T configurati | UTRA TDD PRACH | | 53 | As specified in table 5.7.1-3 in TS 36.211 |
| | bframe configuration | | 6 | As specified in table 4.2-1 in TS 36.211 |
| | vnlink configuration | | 1 | As specified in table 4.2-2 in TS 36.211 |
| E-UTRA F | DD Access Barring n | - | Not Sent | No additional delays in random access procedure. |
| E-UTRA T | DD Access Barring n | - | Not Sent | No additional delays in random access procedure. |
| DRX cycle | elength | 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 | C | ell 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) 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 | | | |
| $N_{oc}^{ m Note~2}$ | 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.4.2.4.2 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 condition | Active cell | | Cell2 | UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during |
| Condition | | | | 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 Number | TRA RF Channel | | 1 | One TDD carrier frequency is used. And Cell 1 is on RF channel number 1. |
| Cell 2 E-U Number | TRA RF Channel | | 2 | One FDD carrier frequencies is used. And Cell 2 is on RF channel number 2. |
| Time offse | t between cells | | 3 ms | Asynchronous cells |
| E-UTRA T configurati | DD PRACH ion | | 53 | As specified in table 5.7.1-3 in TS 36.211 |
| Special su | bframe configuration | | 6 | As specified in table 4.2-1 in TS 36.211 |
| Uplink-dov | Uplink-downlink configuration | | 1 | As specified in table 4.2-2 in TS 36.211 |
| E-UTRA F configurati | DD PRACH ion | | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| E-UTRA F | DD Access Barring n | - | Not Sent | No additional delays in random access procedure. |
| E-UTRA T | DD Access Barring n | - | Not Sent | No additional delays in random access procedure. |
| DRX cycle | elength | 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. |
| Т3 | | 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 | (| Cell 1 | | | Cell 2 | | |
|--|------------|------------|----------|-----|-----------|-----------|-----|--|
| | | T1 | 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) 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 | | | |
| $N_{oc}^{$ | dBm/15 kHz | | | | -98 | | | |
| RSRP Note 3 | dBm/15 KHz | -84 | -84 | -84 | -102 | -infinity | -86 | |
| $\mathbf{\hat{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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 sen | | | Not sent | <u> </u> | | |
| 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.4.2.5.2 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

 $T_{evaluate, E\text{-}UTRAN_inter} \quad \text{See Table 4.2.2.4-1 in clause 4.2.2.4}$

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 | e offset between cells | | 3 µs | Synchronous cells | | |
| Access Ba | Access Barring Information | | Not Sent | No additional delays in random access | | |
| | - | | | procedure. | | |
| Special sul | Special subframe configuration | | 6 | As specified in table 4.2-1 in TS 36.211 | | |
| Uplink-dow | Uplink-downlink 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 | , , | | Γ1 | | 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.4.2.6.1-2: 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 | | C | 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 | | | | Not sent | | |
| Thresh _{x, high} | dB | i i | | | 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.4.2.6.2 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

 $T_{evaluate, E\text{-}UTRAN_inter} \quad \text{See Table 4.2.2.4-1 in clause 4.2.2.4}$

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.4.2.7 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 | Access Barring 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 | T3 | | 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-allowed CSG cell) | | | |
|--|---------------|----------|--------|-------|-----------|----------|-----|-------|----------|------------------------------|--|--|--|
| | | 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 FDD | | | OI | 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 | | • | | | | | | | | | | |
| 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 | | | | | | | |
| 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 | | | 0 | | | | | |
| Snonintrasearch | dB | | -10 | | N | Not sent | | | Not sent | | | | |
| Propagation Condition | | | 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 | Active cell | | Cell1 | UE shall be forced to cell 1 in the initialisation | | |
| condition | | | | 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 offset | t between cells | μs | 3 | Synchronous cells | | |
| Uplink-dow | Uplink-downlink configuration | | 1 | As specified in table 4.2-2 in TS 36.211 | | |
| Special sub | Special subframe configuration | | 6 | As specified in table 4.2-1 in TS 36.211 | | |
| PRACH co | PRACH configuration | | 53 | As specified in table 5.7.1-3 in TS 36.211 | | |
| Access Ba | Access Barring 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

| E-UTRA RF Channel Number BW _{channel} | MHz | T1 | T2 | ТЗ | T1 | T2 | Т3 | (Non-a T1 | Ilowed CS T2 | G cell) T3 |
|--|-------|--------|-----------|-----------|-----------|--------|-----|--------------|-----------------|---------------|
| Number BW _{channel} | MHz | T1 | | Т3 | T1 | T2 | T3 | T1 | TO | T2 |
| Number BW _{channel} | MHz | | 1 | | | | | • • | | 13 |
| BW _{channel} | MHz | | | | | 2 | | | 1 | |
| | MHz | | | | | | | | | |
| | | | 10 | | | 10 | | | 10 | |
| OCNG Pattern defined in | | (| OP.2 TDI | 1 | OP | 2 TDD | | | OP.2 TDD | ı |
| A.3.2.2.2 (OP.2 TDD) | | | JI .Z IDL | | 01 | 2 100 | | | 01.2 100 | |
| 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 | | | | | | | | | |
| 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 | | | | |

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 for the other parameters. | | | | | | | |
| Note 2: This is according to the | te 2: 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

| Unit | Cell 1 | | | Cell 2 | | | | |
|------|---------------------|-----------|---------------------------------------|--|---|--|--|--|
| | T1 T2 T3 | | | T1 | T2 | Т3 | | |
| MHz | 5 5 | | | | | | | |
| | | | | | | | | |
| | OP.16 FDD OP.16 FDD | | | | | | | |
| | | | | | | | | |
| | - ' | T1 MHz | T1 T2 MHz 5 | T1 T2 T3 MHz 5 | T1 T2 T3 T1 MHz 5 5 | T1 T2 T3 T1 T2 MHz 5 5 5 | | |

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 | garaton | | 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 | 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 | 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 reselection 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 | 14 | |
|--|--------|-----|-----------------------------|--------|-------------|-----|---------|----------------------|---------|----------|---------------------|---------|----------|----------|----------------------------|------------------------|----------------------------|---------|-----|
| | | 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 | selecte | d from 2 | 2,3,4 | Rand | omly se | elected | from | Randomly selected from | | | |
| number | | | | | | | such | that ce | _ | | ormal | 5,6,7, | 8,9 suc | h that o | cell 3 | 5,6,7, | 5,6,7,8,9 such that cell 4 | | |
| | | | | | | | | perfor | mance | group | | _ | in the r | | | _ | in the r | | |
| | | | | | | | | | | | | | rforman | | | | rforman | | |
| BW _{channel} | MHz | | 5MHz: $N_{RB} = 25$ | | | | | lz: N _{RB,} | | | 5MHz: $N_{RB} = 25$ | | | | 5MHz: N _{RB} = 25 | | | | |
| | | | 10MHz: N _{RB} = 50 | | | | | Hz: N _{RE} | | | | MHz: N | | | | $10MHz: N_{RB} = 50$ | | | |
| OCNG patterns | | | OP.16 FDD (5MHz) | | | | | FDD (| | | | .16 FDI | | | | .16 FDI | | | |
| | | | OP.2 | FDD (1 | 0MHz) | | | OP.2 I | FDD (1 | 0MHz) | | OP | .2 FDD | (10MH | łz) | OP | .2 FDD | (10MH | lz) |
| 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 | | | | -98 | | | |
| T 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 |
| $\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$ | 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 |
| 1.01.11 | 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: OCNC shall be | | | حالمت ما | fll | بم مالم برا | -41 | <u></u> | 44 | -14 | المحائدة | | | | | | - all OF | DM | ما ما م | |

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

| Parai | neter | 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 | | 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 |
| | | | 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 | n | | 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. |
| Т4 | | 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

| E-UTRA RF Channel number BW _{channel} OCNG Patterns | MHz | ТО | _ | T2 1 Iz: N _{RB} = | Т3 | T4 | | | T2 | Т3 | T4 | T0 | T1 | T2 | T3 | T4 | T0 | T1 | T2 |
|---|--------|-----|----------------------|---|-------|------------------------------|---|--|----------|-----------------------------|---------------------|-------------------|------------------------------|----------------------------|-----------|----------------------------------|--------------|-------------|-----------|
| number BW _{channel} | | | _ | ' | | | | | ted from | | | | | | | | | | |
| BW _{channel} | | | _ | łz: N _{RB} = | | | cell 2 is | Randomly selected from 2,3,4 such that | | | | Randon | nly selecte | ed from 5 | 5,6,7,8,9 | Randomly selected from 5,6,7,8,9 | | | 5,6,7,8,9 |
| | | | _ | łz: N _{RB} = | | | cell 2 is in the normal performance group | | | formance | group | such th | at cell 3 is | s in the r | educed | such th | nat cell 4 i | is in the r | educed |
| | | | _ | lz: N _{RB} = | | | | | | | | performance group | | |) | | performa | nce grou | ρ |
| OCNG Patterns | | | 10MH | 5MHz: N _{RB} = 25 | | | 5MHz: N _{RB} ,= 25 | | | | $5MHz: N_{RB} = 25$ | | | 5MHz: N _{RB} = 25 | | | | | |
| OCNG Patterns | | | $10MHz: N_{RB} = 50$ | | | 10MHz: N _{RB} ,= 50 | | | | 10MHz: N _{RB} = 50 | | | 10MHz: N _{RB,} = 50 | | | | | | |
| 1 | | | 5MHz: OP.10 TDD | | | | | | z: OP.10 | | | | 5MHz: OF | | | 5MHz: OP.10 TDD | | | |
| | | | 10MH | lz: OP.2 | 2 TDD | | 10MHz: OP.2 TDD | | | , | 10MHz: C | |) | | 10MHz: (| |) | | |
| PBCH_RA | dB | 0 | | | | 0 | | | | | C |) | | | (| 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 | | | | -14 | -140 | | -140 | | | |
| N_{oc} Note 2 | dBm15 | | | -98 | | | | | -98 | | | | -9 | 8 | | | -6 | 98 | |
| 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 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 14 | 8 | 8 | 8 | 14 | 8 | 14 | 8 | 8 | 8 | 8 | 8 | 14 | 8 | 8 | 8 | 8 | 8 |
| | 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 | | | | 6 | | | | | 62 | |
| Propagation Condition | | | | AWGN | | | | | AWGN | | | AWGN | | | AWGN | | | | |
| Antenna Configuration | | | 1x2 | | | | 1x2 | | | 1x2 | | | 1x2 | | | | | | |
| Timing offset to Cell 1 | | | | - | | • | _ | | 3ms | _ | | | 3n | ns | | | 3r | ns | |

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 P | E-UTRA PRACH configuration | | RA PRACH configuration | | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| E_UTRA A | E_UTRA Access Barring | | Not Sent | No additional delays in random access | | |
| Information | 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 | | | 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 | | | | | |
| 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 | | | | | |
| Qqualmin for UTRA | dB | | -20 | | | |
| neighbour cell | uБ | | -20 | | | |
| Qrxlevmin for UTRA | dBm | | -115 | | | |
| neighbour cell | dbiii | | -113 | | | |
| 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)

| Parameter | Unit | Ce | ell 2 (UTR | (A) | | |
|-----------------------------------|-----------------|-----------|------------|--------|--|--|
| | | T1 | T2 | Т3 | | |
| UTRA RF Channel Number | | Channel | 2 | | | |
| CPICH_Ec/lor | dB | -10 | | | | |
| PCCPCH_Ec/lor | dB | -12 | -12 | | | |
| SCH_Ec/lor | dB | -12 | | | | |
| PICH_Ec/lor | dB | -15 | | | | |
| OCNS_Ec/lor | dB | -0.941 | | | | |
| \hat{I}_{or}/I_{oc} | dB | -Infinity | 11 | -5 | | |
| I_{oc} | dBm/3,84 MHz | -70 | | | | |
| CPICH_Ec/lo | dB | -Infinity | -10.33 | -16.19 | | |
| CPICH_RSCP | dBm | -Infinity | -69 | -85 | | |
| Propagation Condition | | AWGN | | | | |
| Qqualmin | dB | -20 | | | | |
| Qrxlevmin | dBm | -115 | | | | |
| QrxlevminEUTRA | dBm | -140 | | | | |
| UE_TXPWR_MAX_RACH | dBm | 21 | | | | |
| Treselection | S | 0 | | | | |
| Sprioritysearch1 | dB | 62 | - | | | |
| Sprioritysearch2 | dB | 0 | | | | |
| Thresh _{serving, low} | dB | 36 | | | | |
| Thresh _{x, low} (Note 1) | dB | 50 | - | | | |

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 Active cells condition | | | 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 | 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 | · | | 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 | | | | | |
| 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 | ub | | 20 | | | |
| Qrxlevmin for UTRA | dBm | | -115 | | | |
| neighbour cell | Ī | | _ | | | |
| Qrxlevmin | dBm | | -140 | | | |
| N_{oc} | dBm/15 kHz | | -98 | | | |
| RSRP | dBm/15 KHz | -86 | -102 | | | |
| $\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | 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 | | | | | |
| Note 1. OCNC shall be us | l | aalla aua fu | الممامم مالم بالل | | | |

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 | | | | |
| 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, the 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:

 $T_{evaluateUTRA-FDD}$ 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.4.3.1.3 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 Information | 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 |
| 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 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.4.3.1.3.1-2: 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) | | | OF | 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 | 40 | | | 20 | | |
| cell | dB | | | -20 | | |
| Qrxlevmin for UTRA neighbour | dBm | | | -115 | | |
| cell | ubili | | | -115 | | |
| 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 | |
| | | | | | | |
| \hat{E}_s/N_{oc} | dB | 22 22 -3 -3 | | | | |
| Treselection _{EUTRAN} | S | 0 | | | | |
| Snonintrasearch | dB | | N | ot sent | · | |
| Thresh _{serving, low} | dB | | | 44 | | |
| Thresh _{x, low} (Note 2) | dB | | | 42 | | |
| Propagation Condition | | | E | ETU70 | | |

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 1:

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 val | ue of Threshx | high Which | is included | in UTRA sv | stem | |

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

 $T_{\text{SI-UTRA}}$ 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 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 | erns 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

| Parai | meter | Unit | Value | Comment |
|-------------------------------|----------------|------|--|--|
| Т0 | Active cell | | Cell 1 | To is repeated on each repetition of the test. In To 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-UTF Number | RA RF Channel | | 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 | uration | | 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 | า | | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| Access Barring Inform | 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 reselection 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 5RB) | 6 | 9 | 6 | 9 | 6 | |
| | JKb) | | | | | | |
| | dBm/9 | 56.0 | 61.5 | 56.0 | 61.5 | 56.0 | |
| | Mhz | 5 | 8 | 5 | 8 | 5 | |
| | (50RB) | | | | | | |
| PDSCH parameters: | | | OP.16 | FDD (| 5MHz) | | |
| DL Reference | | | OP.2 | FDD (10 | OMHz) | | |
| Measurement | | | | | | | |
| Channel | | | |) TDD(5 | | | |
| T: " : 11 | | | OP.2 | TDD (10 |)MHz) | | |
| Time offset with | | | | 0 | | | |
| respect to cell1 PBCH RA | dB | | | 0 | | | |
| PBCH RB | dВ | | | 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 | | | | | | |
| 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 | | | | | | | |
| Treselection _{EUTRAN} Snonintrasearch Propagation | S | 0 62 | | | | | |

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 | T1 | T2 | T3 | T4 | T0 | T1 | T2 | T3 | T4 |
| UTRA RF Channel Number | | Randomly selected from 1, 2, 3 such that cell 2 is in the normal performance group | | | 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 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 | | | <u> </u> | | | | | | |
| 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

| Parar | Parameter | | Value | Comment |
|-----------------|--------------|---|--------|---|
| Initial | Active cell | | Cell1 | E-UTRAN cell |
| condition | | | | |
| T1 end | Active cell | | Cell1 | UE shall perform reselection to cell 1 during T1 for |
| condition | | | | subsequent iterations of the test |
| | Neighbour | | Cell2 | 1.28 Mcps TDD OPTION cell |
| | cell | | | |
| T2 end | Active cell | | Cell2 | UE shall perform reselection to cell 2 during T2 |
| condition | Neighbour | | Cell1 | E-UTRA FDD cell |
| | cell | | | |
| CP length of ce | ell 1 | | normal | |
| E-UTRA PRAC | E-UTRA PRACH | | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| configuration | | | | |
| Time offset bet | ween cells | | 3 ms | Asynchronous cells |
| Access Barring | Information | - | Not | No additional delays in random access procedure. |
| | | | sent | |
| Treselection | | S | 0 | |
| DRX cycle leng | jth | 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 | ll 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 | -(| 98 | | | | |
| RSRP | dBm/15kHz | -87 | -101 | | | | |
| \hat{E}_{s}/I_{ot} | dB | 11 | -3 | | | | |
| S _{nonintrasearch} | dB | Not sent | | | | | |
| Thresh _{serving, low} | dB | 46 (-94dBm) | | | | | |
| 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 | | | | | | | |

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 | | (|) | DwPTS | | |
| | | 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 | 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 Active cell condition | | | 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 condition | Active cell | | Cell3 | UE shall perform reselection to cell 3 during T3 | | |
| | 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 configured UTRA RF Channel Number | | | 1, 2, 3, 4, 5, 6, 7 | Seven UTRA TDD carrier frequencies are used in th UE neighbour cell list. Frequencies 4, 5, 6, and 7 ar 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 | CP length of cell 1 | | normal | | | |
| PRACH configuration | | | 4 | As specified in table 5.7.1-2 in TS 36.211 [16] | | |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. | | |
| T _{reselection} | | S | 0 | | | |
| HCS | | | Not used | | | |
| DRX cycle length | | S | 1.28 | The value shall be used for all cells in the test. | | |
| TO | | 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 | | |
| Т3 | | S | 500 | T3 need to be defined so that cell re-selection reaction time is taken into account. | | |
| T4 | T4 | | 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 | Т3 | T4 | | |
| E-UTRA RF Channel number | | 1 | | | | | | |
| BW _{channel} | MHz | 5MHz: N _{RB} = 25 10MHz: N _{RB} = 50 | | | | | | |
| OCNG Patterns | | 5MHz: OP.16 FDD 10MHz: OP.2 FDD | | | | | | |
| PBCH_RA | dB | | | | | | | |
| PBCH_RB | dB | 1 | | | | | | |
| 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 | | | | | | | |
| $N_{oc}^{\overline{NOTE 2}}$ | 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 | | • | | | |
| Snonintrasearch | dB | | Not sent | | | | | |
| Thresh NOTE 4 | dB | 46 (-94dBm) | | | | | | |
| Thresh _{x, low} NOTE 4 | dB | 24 (-79dBm) | | | | | | |
| Propagation Condition | | AWGN | | | | | | |
| Antenna Configuration | | 1x2 | | | | | | |
| | | | | | | | | |

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 | T0 T1 T2 T3 T4 T0 T1 | | | | | T2 | T3 | T4 | |
| UTRA RF Channel Number NOTE 1 | | Rando | mly sele | cted fron | າ 1, 2, 3 ເ | 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 (-7 | 9dBm) | | | | |
| Sprioritysearch2 | dB | 0 | | | | | | | | | |
| Thresh _{x, high} | dB | 46 (-94dBm) | | | | | | | | | |
| Ssearch _{E-UTRA} | dB | | | | | Not | send | | | | |
| Time offset to cell1 | ms | | | | | - 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

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 Number NOTE 1 | | Rand | domly sel | ected fro | m 4, 5, 6 | | that cell : oup | 3 is in the | e reduce | d perform | ance |
| 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 | | | | | | AW | /GN | | | | |
| Q _{rxlevmin} | dBm | | | | | -1 | 03 | | | | |
| Qoffset1 _{s,n} | dB | | | | | C1, (| C2: 0 | | | | |
| Qhyst1 _s | dB | | | | | (| 0 | | | | |
| 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 | | • | • | | • | 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 | 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 | 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 | 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 | N | lot 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 | | Channel 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 | -7 | 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 | 2 | !1 | |
| Treselection | S | |) | |
| Sprioritysearch1 | dB | 4 | -2 | |
| Sprioritysearch2 | dB | | 0 | |
| Thresh _{x, high} (NOTE 1) | dB | 4 | -8 | |
| NOTE 1: This refers to the value of Thresh, that 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 |
| UE configured E-UTRA F | Neighbour cell UE configured E-UTRA RF Channel Number | | Cell 2, cell 3 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 | Channel Number | | 2,3,4,5,6,7 | performance |
| Test eqipment configurat | 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. |
| T0 | | S | (test equipment frequency selection and configuration time) + 960 | Initialisation time need to be defined so that cell detection time is taken into account. |
| | | 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 | 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 | | | -90 | -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 | | |
| a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specifi in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power. | | | | and | | | | |
| for to be fu Note 3: RSRP levels | ulfilled. s have been derived from other parameters for purposes. They are not settable parameters | | | | 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 | | Randomly selected from 1, 2, 3 such that cell 2 is in the normal performance group | | | | | 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 | | | | | | | | | | |
| 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

| Par | ameter | 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 | |
| Uplink-dow configuration | | | 1 | As specified in table 4.2.2 in TS 36.211 |
| Special sub configuration | | | 6 | As specified in table 4.2.1 in TS 36.211 |
| | nfiguration of | | 53 | As specified in table 4.7.1-3 in TS 36.211 |
| CP length of | of cell 1 | | Normal | |
| Time offset | between cells | | 3 ms | Asynchronous cells |
| Access Bar Information | | - | Not sent | No additional delays in random access procedure. |
| T _{reselection} | | S | 0 | |
| DRX cycle | length | 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 | | S | 85 | T2 needs to be defined so that cell re-selection reaction time is taken into account. |
| Т3 | | 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)

| Unit | | | | | |
|-----------|--|--|---|--|--|
| | T1 | T2 | T3 | | |
| | | 1 | | | |
| | | | | | |
| MHz | | 10 | | | |
| dB | <u>J</u> | | | | |
| dB | | | | | |
| dB | | | | | |
| dB | 1 | | | | |
| dB | 1 | | | | |
| dB | 1 | | | | |
| dB | 0 | 0 | 0 | | |
| dB | 7 | | | | |
| dB | 7 | | | | |
| dB |] | | | | |
| dB | | | | | |
| dB | | | | | |
| dB | 1 | | | | |
| dBm/15kHz | -140 | -140 | -140 | | |
| dBm/15kHz | | -98 | | | |
| dBm/15kHz | -87 | -87 | -87 | | |
| dB | 11 | 11 | 11 | | |
| dB | | 24(-79dBm |) | | |
| dB | | 46 | | | |
| | | AWGN | | | |
| | MHz dB dB dB dB dB dB dB dB dB d | MHz dB dB dB dB dB dB dB dB dB d | MHz 10 dB 11 dB 11 dB 11 dB 11 dB 11 dB 11 dB 12 dB | | |

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) | ı | | |
|------------------------------------|-----------------|-----------|-----|----------|--------|-------|----|--|
| Timeslot Number | | | 0 | | | DwPTS | ; | |
| | | T1 | T2 | T3 | T1 | T2 | T3 | |
| UTRA RF Channel Number (NOTE 1) | | Channel 2 | | | | | | |
| PCCPCH_Ec/lor | dB | -3 | -3 | -3 | | | | |
| DwPCH_Ec/lor | 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 (-7 | 9dBm) | | | |
| Thresh _{x, low} (NOTE 2) | dB | | • | 46 (-9 | | • | • | |

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 configuration of cell 1 | | | 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)

| Parameter | Unit | Се | 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 (-7 | 9dBm) | | |
| Propagation Condition | | | 'GN | | |
| | used such that cel | | | | |
| constant total tr | ansmitted power s | pectral density | is achieved | | |
| for all OFDM sy | | | | | |
| | e value of Thresh _x | | | | |
| UTRA system in | nformation, 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 | | (|) | 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 | | -1 | 03 | |
| Qoffset1 _{s,n} | dB | | C1, (| C2: 0 | • |
| Qhyst1 _s | dB | | (|) | • |
| Thresh _{x, high} (Note2) | dB | | | 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-downlink configuration of cell 1 | | | 1 | As specified in table 4.2.2 in TS 36.211 |
| Special sul cell 1 | Special subframe configuration of cell 1 | | 6 | As specified in table 4.2.1 in TS 36.211 |
| | ccess Barring | - | Not Sent | No additional delays in random access |
| Information | 1 | | | 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 | T3 | | <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 | 10 | | | | | |
| 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 | | (| 0 | | | |
| 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 | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 22 | 22 | -3 | -3 | | |
| \hat{E}_s/N_{oc} | dB | 22 22 | | -3 | -3 | | |
| Treselection _{EUTRAN} | S | | | 0 | | | |
| Snonintrasearch | dB | | Not | sent | | | |
| Thresh _{serving, low} | dB | | 4 | 14 | | | |
| Thresh _{serving, low} Thresh _{x, low} (Note 2) | dB | | 2 | 24 | | | |
| Propagation Condition | | | ET | U70 | · | | |

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.4.3.4.3.1-3: Cell specific test parameters for cell 2 (UTRA)

| Parameter | Unit | | | (| Cell 2 | (UTRA |) | | |
|---|--------------------------------------|-------------------|-----|-----|--------|-------|------|------|------|
| Timeslot Number | | | (|) | | | Dw | | |
| | | T1 T2 T3 T4 T1 T2 | | T3 | T4 | | | | |
| UTRA RF Channel Number (Note1) | | | | | Char | nel 2 | | | |
| PCCPCH_Ec/lor | dB | | -: | 3 | | | | | |
| DwPCH_Ec/lor | dB | | | | | | (| 0 | |
| OCNS_Ec/lor | dB | | -; | 3 | | | | | |
| \hat{I}_{or}/I_{oc} | dB | dB 13 13 13 13 | | 13 | 13 | 13 | 13 | 13 | |
| I_{oc} | dBm/1.28 MHz | -80 | | | | | | | |
| PCCPCH RSCP | dBm | -70 | -70 | -70 | -70 | n.a. | n.a. | n.a. | n.a. |
| Propagation Condition | | | | | AW | 'GN | | | |
| Qrxlevmin | dBm | | | | -1 | 03 | | | |
| Qrxlevmin _{EUTRA} | dBm | | | | -1 | 40 | | | |
| UE_TXPWR_MAX_RACH | dBm | | | | 2 | 1 | | | |
| Treselection | S | | | | (|) | | | |
| Thresh _{x, high} (Note2) | dB | | | | 4 | 4 | | | |
| Note1: In the case of multi-freque channel number. Note2: This refers to the value of threshold for the E-UTRA | Thresh _{x, high} which is i | | | | | • | | • | |

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:

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 for lower priority cell reselection, allow 21 s.

A.4.3.4.4 E-UTRA TDD to UTRA TDD cell re-selection for IncMon

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

| Pa | rameter | 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 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 | on Cell1 | | 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 | | | 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. |
| Uplink-dow configuration | on of cell 1 | | 1 | As specified in table 4.2.2 in TS 36.211 [16] |
| Special sul configuration | on of cell 1 | | 6 | As specified in table 4.2.1 in TS 36.211 [16] |
| CP length | | | normal | |
| | nfiguration | | 53 | As specified in table 5.7.1-3 in TS 36.211 [16] |
| Access Ba Information | | ı | Not Sent | No additional delays in random access procedure. |
| Treselection | | S | 0 | |
| HCS | | | Not used | |
| 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 | 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 |
| Т3 | | 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 | | | /Hz: N _{RB} = | | | | | |
| | | 10MHz: $N_{RB} = 50$ | | | | | | | |
| OCNG Patterns | | 5MHz: OP.10 TDD | | | | | | | |
| DDCII DA | 4D | | 1010 | 1Hz: OP.2 | טטו | | | | |
| PBCH_RA | dB dB | | | | | | | | |
| PBCH_RB | | | | | | | | | |
| 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/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 | | 2 | l6 (-94dBn | າ) | | | | |
| Thresh _{x, low} Note 4 | dB | | 2 | 24 (-79dBn | n) | | | | |
| Propagation Condition | | | | AWGN | | | | | |
| Antenna Configuration | | | | 1x2 | | | | | |
| Note 1: OCNG shall be used su | | | ated and a | constant to | tal transmit | ed power | | | |
| spectral density is achie | | | -: f:! : 4 h - | 44: | | | | | |

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: E₃/I_{ot} and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

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.

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 (U | ITRA TDI | D) | | | |
|---------------------------------|------------------|----------|-------------|------------|-----------|-----------|-------------|-----------|-----------|-----------|--------|
| Timeslot Number | | | | 0 | | | | | DwPTS | | |
| | | T0 | T1 | T2 | T3 | T4 | T0 | T1 | T2 | T3 | T4 |
| UTRA RF Channel Number Note1 | | Rando | omly sele | ected from | m 1, 2, 3 | such tha | t cell 2 is | in the no | ormal per | formance | 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 | | | | | | AV | VGN | | | | |
| 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 (-94dBm) | | | | | | | | |
| Ssearch _{E-UTRA} | dB | | • | • | | Not | send | | • | | |
| Time offset to cell1 | ms | | | | | | 3 | | | | |
| Note1: In the case | of multi-frequ | iency ce | II, the UT | RA RF (| Channel | Number | is the prir | mary fred | uency's o | 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 (U | TRA TDE | 0) | | | |
|---------------------------------|--------------------|------|-----------|-----------|-----------|-----------|------------|-------------|--------|-----------|------|
| Timeslot Number | | | | 0 | | | | | DwPTS | | |
| | | T0 | T1 | T2 | T3 | T4 | T0 | T1 | T2 | T3 | T4 |
| UTRA RF Channel Number Note1 | | Rand | lomly sel | ected fro | m 4, 5, 6 | | that cell: | 3 is in the | reduce | d perform | ance |
| 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 | | | | | | AW | /GN | | | | |
| Q _{rxlevmin} | dBm | | | | | -1 | 03 | | | | |
| Qoffset1 _{s,n} | dB | | | | | C1, (| C2: 0 | | | | |
| Qhyst1 _s | dB | | | | | | 0 | | | | |
| Sprioritysearch1 | dB | | | | | 24 (-7 | 9dBm) | | | | |
| 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-frequence | | | | | | | | | | |

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.

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 condition | Active cell | | Cell1 | UE shall be forced to cell 1 in the initialisation 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 condition | Neighbour cell | | Cell2 | UE shall perform reselection to cell 2 during T2. 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 Barring 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

| | 1 | Cell 1 |
|------------|--|--|
| | T1 | T2 |
| | | 1 |
| | | |
| MHz | | 10 |
| | | |
| | IO | P.2 FDD |
| dB | | |
| dB | | 0 |
| dB | | |
| dBm | | -140 |
| dBm/15 kHz | | -98 |
| dBm/15 KHz | -89 | -102 |
| dB | 9 | -4 |
| dB | 9 | -4 |
| S | | 0 |
| dB | Not sent | |
| dB | 44 | |
| dB | 24 | |
| | dB d | 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 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

| Doromotor | Unit | Cell 2 (GSM) | | |
|-------------------------------|------|--------------|------|--|
| Parameter | Unit | T1 | T2 | |
| Absolute RF Channel Number | | ARFO | CN 1 | |
| RXLEV | dBm | -90 | -75 | |
| RXLEV_ACCESS_MIN | dBm | -10 |)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 Barring 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) | | IO | 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{E}_{s}/I_{ot} | dB | 9 -4 | |
| \hat{E}_s/N_{oc} | dB | 9 -4 | |
| TreselectionEUTRAN | S | | 0 |
| Snonintrasearch | dB | Not sent | |
| Thresh _{serving, low} | dB | 44 | |
| Thresh _{x, low} (Note 2) | dB | | 24 |

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 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

| Doromotor | Unit | Cell 2 (GSM) | | |
|-------------------------------|------|--------------|-----|--|
| Parameter | Unit | 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 | Unit | Value | 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 | Channel Number | | 1 | Only one FDD carrier frequency is used. |
| E-UTRA FDD Cha | nnel Bandwidth (BW _{channel}) | MHz | 10 | |
| HRPD RF Channel 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 |
| | | | |

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.

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.4.5.1.1.1-3: 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 | Unit | 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 | E-UTRA TDD Channel Bandwidth (BWchannel) | | 10 | |
| HRPD RF Channe | el Number | | 1 | Only one HRPD carrier frequency is used. |
| E-UTRA TDD PRACH configuration of cell 1 | | | 53 | As specified in table 4.7.1-3 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.4.5.2.1.1-2: Cell Specific Test Parameters for E-UTRAN TDD (Cell # 1)

| Parameter | Unit | Ce | II 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 |

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.

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 | | | 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 PR | 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.4.6.1.1.1-2: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

| Parameter | Unit | Ce | Cell 1 | | |
|------------------------------------|------------|------|----------|--|--|
| | | T1 | T2 | | |
| E-UTRA RF Channel number | | 1 | | | |
| BW _{channel} | MHz | 1 | 10 | | |
| OCNG Patterns defined in A.3.2.1.2 | | | | | |
| (OP.2 FDD) | | OP.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 | | | | |
| N_{oc} Note 2 | dBm/15 kHz | -9 | -98 | | |
| 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 | (| Ö | | |
| Snonintrasearch | dB | Not | Not sent | | |
| cellReselectionPriority | - | 1 | | | |
| Qrxlevmin | dBm | -140 | | | |
| Qrxlevminoffset | dB | 0 | | | |
| Pcompensation | dB | (|) | | |
| S _{Serving} Cell | dB | 51 | 38 | | |
| Thresh _{serving, low} | dB | 4 | 4 | | |
| Propagation Condition | | AWGN | | | |
| N. (4 00NO 1 III 1 1 III | | | | | |

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.

Parameter Unit Cell 2 T1 **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 Channel Bandwidth (BWchannel) | | MHz | 10 | |
| cdma2000 1X RF Channel Number | | | 1 | Only one cdma2000 1X carrier frequency is used. |
| E-UTRA TDD PR | ACH configuration | | 53 | As specified in table 5.7.1-3 in TS 36.211 |
| 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 |
| E_UTRA TDD Ac | cess 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 | Cell 1 | | |
|--|------------|----------|------|--|
| | | T1 | T2 | |
| E-UTRA RF Channel number | | | 1 | |
| BW _{channel} | MHz | 10 | | |
| OCNG Patterns defined in A.3.2.2.2 | | | | |
| (OP.2 TDD) | | 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 | | | |
| $N_{oc}^{ m Note 2}$ | dBm/15 kHz | -98 | | |
| RSRP Note 3 | 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 | Ö | | |
| Snonintrasearch | dB | Not sent | | |
| cellReselectionPriority | - | | 1 | |
| Qrxlevmin | dBm | -140 | | |
| Qrxlevminoffset | dB | 0 | | |
| Pcompensation | dB | | 0 | |
| ServingCell | dB | 51 | 38 | |
| Thresh _{serving, low} | dB | 44 | | |
| Propagation Condition | | AWGN | | |
| | | | | |

Note 1: CNG 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: 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 T1 **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

| Par | ameter | Unit | Value | Comment |
|---------------------|-------------------------------|------|---|--|
| PDSCH parameter | rs . | | DL Reference Measurement Channel R.0 FDD | As specified in clause A.3.1.1.1 |
| PCFICH/PDCCH/F | 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 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 | 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 | | 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 | | | | | | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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 | | |
| Propagation Condition | | | 1 | l . | AWGN | II. | | | |
| Note 1: OCNG shall b | ne used such that | both cells a | re fully alloc | | | ansmitted nowe | 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.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

| Pa | rameter | 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/PDCCHF | PHICH 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 Chan | nel Number | | 1 | Only one TDD carrier frequency is used. |
| Channel Bandwid | th (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 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 c | 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 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 | | _ | | | _ | | |
| PDCCH_RA | dB | | 0 | | | 0 | | |
| PDCCH_RB | dB | | | | | | | |
| PDSCH_RA | dB | | | | | | | |
| PDSCH_RB | dB | | | | | | | |
| OCNG_RA ^{Note 1} | dB | | | | | | | |
| OCNG_RB ^{Note 1} | dB | | | | | | | |
| ${ m \hat{E}}_{ m s}/{ m I}_{ m ot}$ | dB | 8 | -3.3 | -3.3 | -Infinity | 2.36 | 2.36 | |
| Noc 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 used such that | both cells a | re fully allocation | ated and a co | onstant total tra | ansmitted power | 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_{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

| Par | ameter | Unit | Value | Comment |
|---------------------|----------------------------|------|--------------------------|--|
| PDSCH parameter | rs | | 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 | nel number | | 1, 2 | Two FDD carriers are used |
| Channel Bandwidt | h (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 configurat | ion | | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| Access Barring Inf | ormation | - | Not sent | No additional delays in random |
| | | | | access procedure |
| Time offset between | en cells | | 3 ms | Asynchronous cells |
| Gap pattern config | uration 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 | | | | | | |
| | e used such that b | ooth cells a | re fully alloca | ated and a cons | stant total tra | ansmitted powe | r 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.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 | | 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 Bandwic | th (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 | nformation | - | 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 | configuration | | 1 | As specified in table 4.2-2 in TS 36.211 |
| PRACH configura | PRACH configuration | | 53 | As specified in table 5.7.1-3 in TS 36.211 |
| Time offset between | en cells | | 3 μs | Synchronous cells |
| T1 | | S | 5 | |
| T2 | | S | ≤5 | |
| T3 | <u> </u> | 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 | Т3 | 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 | <i>r</i> -91 | -91 | |
| Propagation Condition | | AWGN | | | | | | |
| Note 1: OCNG shall b | | | | | | | | |
| 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.5.1.4.2 **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%.

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.5.1.5 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 | 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 | 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 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 | | Cell 2 T1 T2 | | | | |
|--------------------------------------|--------------------|----------|----------|---------------------------|----------|--|--|--|
| | | T1 | T1 T2 | | T2 | | | |
| E-UTRA RF Channel | | 1 | | 2 | | | | |
| number | | | | | | | | |
| BW _{channel} | MHz | 10 | 1 | 10 | 1 | | | |
| 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 | | | |
| $N_{oc}^{ m Note~2}$ | 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 | | | | | | |
| Note 1: OCNG shall be density is ach | ieved for all OFDM | symbols. | | stant total transmitted p | • | | | |

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.

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

 $T_{interrupt}$ = 115 ms in the test. See clause 5.1.2.1.2

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

| Pa | rameter | Unit | Value | Comment |
|---------------------------|-------------------|------|--------------------------|-------------------------------------|
| PDSCH paramete | rs | | 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/I | 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 | nel number | | 1, 2 | Two TDD carriers |
| DRX | | | OFF | Non-DRX test |
| Access Barring Inf | ormation | - | 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 configurat | tion | | 53 | As specified in table 5.7.1-3 in TS |
| | | | | 36.211 |
| Time offset between cells | | | 3 μs | Synchronous cells |
| Gap pattern configuration | | | - | 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 | Ce | II 1 | Ce | ell 2 | |
|--|---------------------|---------------------|-----------------|---------------------|----------------|--|
| | | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | | 1 | 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 | (| 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 | -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 1: OCNG shall be | e used such that he | oth cells are fully | allocated and a | constant total trai | nsmitted 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: 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 | | • | | | |
| 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 | | 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 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 | | 10 | | | | | |
| 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 | | | | |
| $N_{oc}^{ m Note~2}$ | dBm/15 kHz | | -98 | | | | | |
| \hat{E}_s/N_{oc} | dB | -Infinity | 7 | 7 | | | | |
| RSRP Note 3 | dBm/15 KHz | -Infinity | -91 | -91 | | | | |
| Propagation Condition | | 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 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 | | 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 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 | | 10 | | | | |
| 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} 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 | 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 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 Un | | Value | Comment | | |
|--|-----|--------------------------|----------------------------------|--|--|
| PDSCH parameters | | | 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 to the principle defined in section A.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 other cell-specific test parameters. | | | | | | | |

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 | | DL Reference Measurement | As specified in clause A.3.1.1.3 |
| - | | | Channel R.13 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 | |
| | 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 | Access Barring Information | | 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 cells | | | 3 ms | Asynchronous cells |
| T1 | T1 | | 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 | | 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 | | |
| $N_{oc}^{ m Note~2}$ | 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 | | | | | | |

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

| Parameter | | Unit | 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 configuration | | | 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 | | 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 | | | | | | | | |
| $\hat{E}_{\scriptscriptstyle \mathrm{s}}/I_{\scriptscriptstyle \mathrm{ot}}$ | dB | 8 | -3.3 | -3.3 | -Infinity | 2.36 | 2.36 | | |
| $N_{oc}^{ m Note~2}$ | dBm/15 KHz | | | | -98 | <u> </u> | <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 | | | | | | | |
| Note 1: OCNG shall b | e used such that | both cells a | re fully alloc | ated and a c | onstant total tra | ansmitted power | 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.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

| Par | ameter | Unit | Value | Comment |
|-------------------------------|----------------------------|------|---|--|
| PDSCH parameter | PDSCH parameters | | 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 Chann | nel Number | | 1 | Only one TDD 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. |
| Special subframe of | 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 |
| 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 | 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 | 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 1: OCNG shall b | e used such that | both cells a | re fully alloc | | | 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.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 | | 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 cell |
| | Neighbouring cell | | Cell 2 | UTRAN cell |
| Final condition | Active cell | | Cell 2 | UTRAN cell |
| Channel Bandwidt | h (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 | easurement quantity | | RSRP | Started before 12 Starts |
| Inter-RAT (UTRAN quantity | FDD) measurement | | CPICH Ec/N0 | |
| b2-Threshold1 | | dBm | -90 | Absolute E-UTRAN RSRP threshold for event B2 |
| b2-Threshold2-UTRA | | 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 Inf | ormation | - | Not sent | No additional delays in random access procedure |
| E-UTRA RF Chani | nel Number | | 1 | One E-UTRA FDD carrier frequency is used. |
| E-UTRA Channel Bandwidth (BWchannel) | | MHz | 10 | |
| UTRA RF Channe | 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 pe | eriod | | 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 | nit Cell 1 (E-UTRA) | | RA) | | | |
|---------------------------|------------|---------------------|--------|--------|--|--|--|
| | | 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 | 1 | | | | | |
| 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 | 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 | -67.21 | | | |
| Propagation Condition | | | AWGN | • | | | |
| | | | | | | | |

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 | Ce | II 2 (UTR | 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

| Para | meter | Unit | Value | Comment |
|---|---------------------|------|---|--|
| PDSCH parameter | s (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 | |
| Special subframe of | configuration | | 6 | As specified in table 4.2-1 in TS 36.211. Applicable to cell 1. |
| Uplink-downlink co | nfiguration | | 1 | As specified in table 4.2-2 in TS 36.211. Applicable to cell 1 |
| E-UTRAN TDD me | easurement quantity | | RSRP | |
| quantity | FDD) measurement | | CPICH Ec/lo | |
| b2-Threshold1 | | dBm | -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 config | uration Id | | 0 | As specified in Table 8.1.2.1-1; to start before T2 starts |
| E-UTRA RF Chanr | nel 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. |
| Monitored UTRA FDD cell list size | | | 12 | UTRA cells on UTRA RF channel 1 provided in the cell list before T2. |
| Post-verification 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 | | | |

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 | Се | Cell 1 (UTRA) | | |
|---|-----------------|-----------|---------------|--------|--|
| | | 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 | | | |
| 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.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

| 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, parameters | PCFICH/PDCCH/PHICH parameters | | 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 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 | <u> </u> | 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 | 3 3 | | | | |
| 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 | -98 (AWGN) | | | | |
| 1 voc | kHz | 55 (7.117 5117) | | | | |
| \hat{E}_s/N_{oc} | dB | 4 | | | | |
| RSRP Note 3 | dBm/15kH z | -94 | | | | |
| Propagation | | AVACAL | | | | |
| Condition | | AWGN | | | | |
| | | ch that cell 1 is fully allocated | | | | |
| 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. | | | | | | |
| | | | | | | |
| 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 | | ARFCN 1 | | |
| Number | | AK | FCN I | |
| 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 ms (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. |
| of cell 1 | Uplink-downlink configuration 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 | CP length of cell 1 | | Normal | |
| Time offset bety | Time offset between cells | | 3 ms | Asynchronous cells |
| Access Barring | Information | | Not Sent | No additional delays in random access procedure. |
| Assigned Sub-C | 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 | | 01.1100 | | TDD | | | | |
| TDD) | | | 1 | | | | | |
| 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 | | | | | | | |
| $\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | 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 call is fully allocated and a constant | | | | | | | | |

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 | | Channel 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.5.2.4.1.3 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 | Parameter | | 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 | 1 | | Normal | |
| Access Barring Ir | Access Barring Information | | Not Sent | No additional delays in random access procedure. |
| 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 | | dB | 0 | |
| Thresh1 | | dBm | -93 | Absolute E-UTRAN RSRP threshold for event B2 |
| Thresh2 | | dBm | -80S | Absolute UTRAN RSCP threshold for event B2 |
| T1 | | S | 5 | |
| T2 | | S | ≤ 10 | |
| T3 | | S | 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 b | e used such that I | ooth cells are | fully allocated a | 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 (U | TRA) | | |
|-----------------------------------|--------------|--------|--------|-----------|------|------|----|
| Timeslot Number | | 0 Dv | | 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 | | | | AWG | N | | |

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 | rameter | Unit | Value | Comment |
|--|-------------------------|------|---|---|
| PDSCH paramete | 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 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 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 | <u> </u> | S | 20 | |
| T2 | <u> </u> | 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 | Се | Cell 1 | | |
|---|------------|----------|----------|--|--|
| | | T1, T2 | Т3 | | |
| E-UTRA RF Channel Number | | 1 | 1 | | |
| BW _{channel} | MHz | 1 | 0 | | |
| 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 | | | | |
| 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{E}_s/N_{oc} | dB | 2 | 1 | | |
| $N_{\it oc}$ Note 2 | dBm/15 kHz | -98 (A | WGN) | | |
| \hat{E}_s/I_{ot} | dB | 2 | 4 | | |
| RSRP Note 3 | dBm/15kHz | -g | 94 | | |
| Propagation Condition | | AW | 'GN | | |

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 | | | | |
| 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

| Par | ameter | Unit | Value | Comment |
|-----------------------------------|-----------------------------|------|--------------------------|-----------------------------------|
| PDSCH paramete | PDSCH parameters | | DL Reference Measurement | As specified in clause A.3.1.1.1 |
| | | | 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 quantity | N FDD) measurement | | CPICH Ec/N0 | |
| 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 | 1 | 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 |] | | |
| 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 | 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 | |
| Note 1: OCNG shall be use | ed such that both | cells are fully | allocated and | |
| a constant total trai | nsmitted power s | spectral density | is achieved | |
| for all OFDM symb | ols. | • | | |
| Note 2: Interference from o | ther cells and no | oise sources no | t specified in | |
| the test is assumed | to be constant | over subcarrier | s and time | |
| and shall be model | led as AWGN of | appropriate po | ower 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) | | (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 paramete | ers | | 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 |
| 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 |
| 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 | | Λ. | WGN | | |
| Condition | | <u> </u> | WWGN | | |
| | | hat cell 1 is fully allocate | | | |
| | | density is achieved for al | | | |
| | | s and noise sources not | | | |
| assumed t | o be constant over | er subcarriers and time a | nd shall be modelled as | | |
| AMON - | | er for N_{oc} to be fulfilled. | | | |
| AVVGN OF | appropriate powe | rived from other paramet | are for information | | |
| | | rived from other paramet | | | |
| 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 | |
| Absolute RF Channel | | ARFCN 1 | | |
| Number | | | | |
| 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 paramete | DSCH 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 OCNG_RB Note1 | dB | | | | |
| - | 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 | | - | | | |
| Condition | | A | WGN | | |
| Note 1: OCNG sha | all be used such t | hat cell 1 is fully allocate | d and a constant total | | |
| | | density is achieved for al | | | |
| | | s and noise sources not s | | | |
| assumed t | o be constant over | er subcarriers and time a | nd shall be modelled as | | |
| A1A/C1: (| | er for N_{oc} to be fulfilled. | | | |
| AWGN of | appropriate powe | er for $\frac{\partial c}{\partial t}$ to be fulfilled. | | | |
| | | rived from other parameter | | | |
| purposes. | They are not sett | able parameters themse | ives. | | |

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 | |
| 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 | meter | Unit | Value | Comment |
|--------------------------------|-------------------|------|-------------------------------------|--|
| PDSCH param | neters | | DL Reference Measurement Channel | As specified in clause A.3.1.1.2 |
| | | | 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 ce | ell 1 | | Normal | |
| Uplink-downlin configuration o | | | 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 | | | o | 7.3 Specified III table 4.2.1 III 10 30.211 |
| Time offset bet | tween cells | | 3 ms | Asynchronous cells |
| Access Barring | g Information | | Not Sent | No additional delays in random access |
| | | | | procedure. |
| Assigned Sub- | -Channel | | 1 | No additional delays in random access |
| Number | | | | procedure due to ASC. |
| TimeToTrigger | <u> </u> | S | 0 | |
| Filter coefficier | nt | | 0 | L3 filtering is not used |
| DRX | | | OFF | |
| 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 | Ce | II 1 |
|--------------------------|-----------------------|-------------------|----------|
| | | T1 | T2 |
| E-UTRA RF Channel | | | 1 |
| Number | | | |
| BWchannel | MHz | 1 | 0 |
| 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) | | | |
| 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 | 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 | | AW | /GN |
| Note 1: OCNG shall be us | sed such that cell is | s 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)

| Parameter | Unit | | Cell 2 | UTRA) | | | |
|--|--------------|-----------|--------|-----------|----|-----|-----|
| Timeslot Number | | 0 | | 0 | | DwF | PTS |
| | | T1 | T2 | T1 | T2 | | |
| UTRA RF Channel Number ^{Note1} | | | Char | nel 2 | | | |
| PCCPCH_Ec/lor | dB | -(| 3 | | | | |
| DwPCH_Ec/lor | dB | | | 0 | | | |
| OCNS_Ec/lor | dB | -3 | | | | | |
| \hat{I}_{or}/I_{oc} | dB | -infinity | 13 | -infinity | 13 | | |
| I_{oc} | dBm/1.28 MHz | | -8 | 30 | | | |
| PCCPCH RSCP | dBm | -infinity | -70 | n.a | a. | | |
| Propagation Condition | | | AW | 'GN | | | |

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

| Para | meter | Unit | Value | Comment |
|---------------------------------|--------------------------|------|---|---|
| PDSCH parameters | PDSCH parameters | | DL Reference Measurement Channel R.0 FDD | As specified in clause A.3.1.1.1 |
| PCFICH/PDCCH/PI | HICH 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 | |
| quantity | FDD) measurement | | CPICH Ec/lo | |
| b2-Threshold1 | | dBm | -90 | Absolute E-UTRAN RSRP threshold for event B2 |
| b2-Threshold2-UTR | Α | 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 Info | rmation | - | Not sent | No additional delays in random access procedure |
| E-UTRA RF Channe | el Number | | 1 | One E-UTRA FDD carrier frequency is used. |
| E-UTRA Channel B (BWchannel) | | MHz | 10 | |
| UTRA RF Channel | Number | | 1 | One UTRA FDD carrier frequency is used. |
| Monitored UTRA FD | | | 12 | UTRA cells on UTRA RF channel 1 provided in the cell before T2. |
| Post-verification per | riod | | 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 | | | |
| PDSCH_RA | dB | | | |
| PDSCH_RB | dB | | | |
| OCNG_RA ^{Note 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 | -67.21 | -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 |
| UTRA RF Channel Number | | | Channel 1 | | | Channel 2 | |
| Cell type | | Primary Serving HS-DSCH Secondary Serving Cell Cell | | | S-DSCH | | |
| 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 | |
| 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 | 4 | • | • | -70 | • | • |
| 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

| Paran | neter | Unit | Value | Comment |
|---|--------------------------------|------|---|--|
| PDSCH parameters | PDSCH parameters (E-UTRAN TDD) | | DL Reference Measurement Channel R.0 TDD | As specified in clause A.3.1.1.2 |
| PCFICH/PDCCH/PF (E-UTRAN TDD) | HICH parameters | | DL Reference Measurement Channel R.6 TDD | As specified in clause A.3.1.2.2 |
| Initial conditions A | Active cell | | Cell 1 | Cell 1 is on E-UTRA RF channel number 1. |
| N | Neighbour cell | | Cell 2 | Cell 2 is on UTRA RF channel number 1. |
| Final conditions A | Active cell | | Cell 2 and cell 3 | |
| Special subframe co | onfiguration | | 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 |
| E-UTRAN TDD mea | | | RSRP | |
| Inter-RAT (UTRA FI quantity | DD) measurement | | CPICH Ec/Io | |
| b2-Threshold1 | | dBm | -90 | Absolute E-UTRAN RSRP threshold for event B2 |
| b2-Threshold2-UTR | Α | 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 configu | ration Id | | 0 | As specified in Table 8.1.2.1-1; to start before T2 starts |
| E-UTRA RF Channe | el Number | | 1 | One E-UTRA TDD carrier frequency is used. |
| E-UTRA Channel Ba (BW _{channel}) | | MHz | 10 | |
| UTRA RF Channel N | Number | | 1 | One UTRA FDD carrier frequency is used. |
| Monitored UTRA FD | DD cell list size | | 12 | UTRA cells on UTRA RF channel 1 provided in the cell list before T2. |
| Post-verification per | riod | | 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 | Т3 |
| 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 | 01.2 100 |
| 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{E}_{s}/I_{ot} | dB | 0 | 0 | 0 |
| $\mathbf{L}_{\mathrm{s}}/1_{\mathrm{ot}}$ | | | | |
| ^ / | dB | 0 | 0 | 0 |
| \hat{E}_s/N_{oc} | иь | U | 0 | 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 lo 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 | |
| DPCH_Ec/lor dB Note 1 N/A | |
| | |
| 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 | J |

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) | | TRA) | | | |
|-----------------------|----------------|---|-----------------|----------------|---------------|--|--|--|
| | | | 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 | transmitted power | spectral d | ensity is ach | ieved for all | | | |
| | OFDM symbo | ymbols. | | | | | | |
| Note 2: | RSRP and lo | d lo levels have been derived from other parameters for | | | | | | |
| | | tion 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 | Active cell | | Cell 1 | E-UTRAN FDD cell |
| | Neighbouring cell | | Cell 2 | HRPD cell |
| Final condition | Active cell | | Cell 2 | HRPD 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 me | asurement quantity | | RSRP | |
| Inter-RAT (HRPD) | | | 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 | | | 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 B (BWchannel) | Bandwidth | MHz | 10 | |
| HRPD RF Channel | Number | | 1 | One HRPD carrier frequency is used. |
| HRPD neighbour ce | ell list size | | 8 | HRPD cells on HRPD 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.5.3.1.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to HRPD cell # 2

| Parameter | Unit | Cell 1 (E-UTRA) | | A) | |
|---------------------------|--------|-----------------|-------|------|--|
| | | T1 | T1 T2 | | |
| 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 | | | | |
| $N_{oc}^{ m Note~2}$ | dBm/15 | | -98 | | |
| | kHz | | | | |
| RSRP Note 3 | dBm/15 | -98 | -98 | -98 | |
| | KHz | | | | |
| \hat{E}_s/N_{oc} | dB | 0 0 0 | | 0 | |
| \hat{E}_s/I_{ot} | dB | 0 0 0 | | 0 | |
| 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.

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 | 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.5.3.1.2 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

| Parameter | | Jnit | Value | Comment |
|--------------------------------------|---------------|------|---|--|
| PDSCH parameters | | | Channel R.0 FDD | As specified in clause A.3.1.1.1 |
| PCFICH/PDCCH/PHICH p | arameters | | 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 |
| Neighb | ouring cell | | Cell 2 | cdma2000 1X cell |
| Final condition Active | | | Cell 2 | cdma2000 1X cell |
| Channel Bandwidth (BW _{cha} | annel) IV | 1Hz | 10 | |
| Gap Pattern Id | | | 0 | As specified in Table 8.1.2.1-1 started before T2 starts |
| E-UTRAN FDD measurem | ent quantity | | RSRP | |
| Inter-RAT (cdma2000 1X) | | | CDMA2000 1xRTT Pilot | |
| quantity | | | Strength | |
| b2-Threshold1 | d | Bm | -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 Information | 1 | - | Not sent | No additional delays in random access procedure |
| E-UTRA RF Channel Num | ber | | 1 | One E-UTRA FDD carrier frequency is used. |
| E-UTRA Channel Bandwid (BWchannel) | th N | ИHz | 10 | |
| cdma2000 1X RF Channel | Number | | 1 | One HRPD carrier frequency is used. |
| cdma2000 1X neighbour co | ell list size | | 8 | cdma2000 1X cells on cdma2000 1X 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 | | 3 | ≥10 | |

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 | Co | 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 | | | | |
| Note 2 | dBm/15 | | -98 | | |
| | kHz | | | 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 | dition AWGN | | | - | |
| Note 1: OCNG shall be us | ed such that | both cells are | fully allocate | ed and a | |
| constant total tran OFDM symbols. | | | | | |
| Note 2: Interference from | other cells an | d noise sour | ces not speci | fied in the | |
| test is assumed to | | | | | |
| | | | N | | |

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:

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 1 | (X) |
|--|-------------------|-------------|---------------|-----|
| | | T1 | T2 | Т3 |
| Pilot E _c | 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 | | 0 |
| I_{oc} | dBm/1.2288 MHz | -55 | | |
| CDMA2000 1xRTT Pilot Strength | dB | -infinity | -10 | -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 paramete | rs | | 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 Chan | nel Number | | 1 | One E-UTRA FDD carrier frequency is used. |
| E-UTRA Channel (BWchannel) | Bandwidth | 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 | |) | | |
| 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 | | 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.

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 | 3 | |
| 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.

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.

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 | Access Barring Information | | 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-Search | WindowSize | | 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 | UTRAN 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 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

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 | | AWGN | | |

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

| Parame | ter | Unit | Value | Comment |
|------------------------------------|--------------------|------|---|--|
| PDSCH parameters | | | Channel R.0 TDD | As specified in clause A.3.1.1.2 |
| PCFICH/PDCCH/PHIC | H parameters | | DL Reference Measurement Channel R.6 TDD | As specified in clause A.3.1.2.2 |
| Initial conditions Act | tive cell | | Cell 1 | E-UTRAN TDD cell |
| | ighbouring cell | | Cell 2 | HRPD cell |
| | tive cell | | Cell 2 | HRPD cell |
| Channel Bandwidth (B) | $N_{\sf channel})$ | MHz | 10 | |
| Gap Pattern Id | | | 0 | As specified in Table 8.1.2.1-1 started before T2 starts |
| E-UTRAN TDD measu | rement quantity | | RSRP | |
| Inter-RAT (HRPD) mea | asurement | | CDMA2000 HRPD Pilot | |
| quantity | | | Strength | |
| b2-Threshold1 | | dBm | -90 | Absolute E-UTRAN RSRP threshold for event B2 |
| b2-Threshold2-CDMA2 | 2000 | 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 | 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 TDD carrier frequency is used. |
| E-UTRA Channel Band (BWchannel) | lwidth | MHz | 10 | |
| Uplink-downlink configu | uration of cell 1 | | 1 | As specified in table 4.2.2 in TS 36.211 |
| Special subframe confi | guration of cell 1 | | 6 | As specified in table 4.2.1 in TS 36.211 |
| HRPD RF Channel Nu | mber | | 1 | One HRPD carrier frequency is used. |
| HRPD neighbour cell li | | | 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.5.3.5.1-2: Cell specific test parameters for E-UTRAN TDD cell#1 for handover to HRPD 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 | | | |
| 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} Note 2 | dBm/15 | | -98 | | |
| | kHz | | | | |
| 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 used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all | | | | | |
| OFDM symbols. | ismilieu powe | ı specilal del | isity is achie | veu ioi ali | |
| | 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 A | be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. | | | | |
| Note 3: RSRP levels have | RSRP levels have been derived from other parameters for | | | | |

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

Table A.5.3.5.1-3: Cell specific test parameters for HRPD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

| 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

| 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 | | Cell 1 | E-UTRAN TDD cell |
| Neighbouring cell | | Cell 2 | cdma2000 1X cell |
| Final condition | | 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 measurement quantity | | RSRP | |
| Inter-RAT (cdma2000 1X) measureme | | CDMA2000 1xRTT Pilot | |
| quantity | | 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 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 | |
| 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-SearchWindowSize | | 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) | | | | | | |
|---------------------------|--|-----------------|----------------|----------|--|--|--|--|
| | | 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_RANote 1 | dB | | | | | | | |
| OCNG_RB ^{Note 1} | dB | | | | | | | |
| Noc Note 2 | dBm/15 | -98 | | | | | | |
| | kHz | | | | | | | |
| 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 transmitted power spectral density is achieved for all | | | | | | | |
| Note 2: Interference from | | | | | | | | |
| test is assumed to | test is assumed to be constant over subcarriers and time and shall | | | | | | | |
| | N | | | | | | | |
| be modelled as Al | 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 purpos | 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 1X) | | | |
|--|-------------------|----------------------|--|-----|--|
| | | T1 | | T3 | |
| $\frac{\text{Pilot} \text{E}_{\text{c}}}{\text{I}_{\text{or}}}$ | dB | -7 | | | |
| Sync E _c I _{or} | dB | -16 | | | |
| $\frac{\text{Paging} \text{E}_{c}}{\text{I}_{or}} \text{(4.8 kbps)}$ | dB | -12 | | | |
| \hat{I}_{or}/I_{oc} | dB | -infinity 0 | | | |
| I_{oc} | dBm/1.2288 MHz | -55 | | | |
| CDMA2000 1xRTT Pilot Strength | dB | -infinity -10 | | -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 | | ms | 0 | Radio link failure timer; T310 is disabled |
| T311 | | ms | 3000 | RRC re-establishment timer |
| DRX | | | OFF | |
| CP length | | | Normal | |
| Access Barring Info | 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 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.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:

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{freq} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 $T_{SI} = 1280$ 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

| Para | ameter | Unit | Value | Comment |
|---------------------|----------------------------|------|---|--|
| PDSCH parameters | 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 | n (BW _{channel}) | MHz | 10 | |
| N310 | 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. |
| PRACH configurati | on 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 | | 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 | | | | | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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 | -94 -Infinity -Infinity - Infinity -91 | | | | | |
| 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.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:

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{\text{freq}} = 2$$

$$T_{\text{search}} = 800 \text{ ms}$$

 $T_{SI} = 1280$ 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 | 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 | inel 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 configuration | | | 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 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 | | | | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 1.54 | -Infinity | -Infinity | -3.79 | 4 | 4 |
| $N_{oc}^{\text{Note 2}}$ | 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 | | | | | -94 |
| Propagation Condition | | | | | AWGN | *** 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.

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:

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{freq} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 $T_{SI} = 1280$ 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 | meter | Unit | Value | Comment |
|-------------------------------|--------------------------|--------|--------------------------|--|
| PDSCH parameters | 5 | | DL Reference Measurement | As specified in clause A.3.1.1.2 |
| · · | | | Channel R.0 TDD | |
| PCFICH/PDCCH/PI | 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 | |
| | Active cell | | Cell 2 | |
| E-UTRA RF Channe | | | 1 | |
| E-UTRA RF Channe | ` / | | | |
| | frequency carrier list | | 2 | 2 E-UTRA TDD carrier |
| size | | | · | frequencies in total: 1 intra- |
| 0.20 | | | | frequency and 1 inter-frequency |
| Channel Bandwidth | (BW _{channel}) | MHz | 10 | inequency and i interinequency |
| N310 | (DVV channel) | - | 1 | Maximum consecutive out-of-sync |
| 14010 | | | | indications from lower layers |
| N311 | | | 1 | Minimum consecutive in-sync |
| 14011 | | | ' | indications from lower layers |
| T310 | | ms | 0 | Radio link failure timer; T310 is |
| 1310 | | 1113 | o o | disabled |
| T311 | | ms | 5000 | RRC re-establishment timer |
| DRX | | 1113 | OFF | TATO TE-ESTABIISTITIETT TITLET |
| CP length | | | Normal | |
| Access Barring Info | rmation | | Not Sent | No additional delays in random |
| | | | Not Sent | access procedure. |
| Special subframe co | onfiguration | | 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 |
| PRACH configuration | on index | | 53 | As specified in table 5.7.1-3 in TS 36.211 |
| Time offset between | n cells | μs | 3 | Synchronous cells |
| T1 | | β 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 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.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:

$$T_{re\text{-establish delay}} = T_{UL \text{ grant}} + T_{UE \text{ re-establish delay}}$$

Where:

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{\text{freq}} = 2$$

$$T_{\text{search}} = 800 \text{ ms}$$

 $T_{SI} = 1280$ 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 pr | inciple de | efined 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 | | 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 | | | | | | | |
| A.3.2.1.16 (OP.16 | | | | | | | |
| FDD) | | | | | | | |
| 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 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 parameter | S | | DL Reference Measurement Channel R.13 FDD | As specified in clause A.3.1.1.3 |
| PCFICH/PDCCH/P | 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 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 | n 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 | | • | | | • | |
| 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 | 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 | | | | | |
| | e used such that | both cells a | re fully alloca | ated and a c | onstant total tra | ansmitted power | er spectral |
| 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.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:

$$T_{UE_re\text{-}establish_delay} = 50 \ ms + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{\text{freq}} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 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

| Parameter | | Unit | Value | Comment |
|-------------------------------|----------------------------|------|--|---|
| PDSCH paramete | 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 |
| 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 FDD carrier frequency is used. |
| Channel Bandwidt | h (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 | Access Barring Information | | Not Sent | No additional delays in random access procedure. |
| PRACH configurat | PRACH configuration index | | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| Time offset between | Time offset between cells | | 3 | Asynchronous cells |
| T1 | | | 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 | | 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 | r 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.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%.

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:

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{freq} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 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/F | 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 | h (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 |
| $N_{oc}^{ m Note~2}$ | 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 | | | | | | |
| | e used such that | both cells a | are fully alloca | ated and a c | onstant total tra | ansmitted power | er 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.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%.

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:

$$T_{UE_re\text{-}establish_delay} = 50 \ ms + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$$N_{freq} = 1$$

$$T_{\text{search}} = 100 \text{ ms}$$

 $T_{SI} = 1280$ 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{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 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 | | | | | | | |

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 | | |
| $\hat{E}_{\scriptscriptstyle{\mathrm{s}}}/I_{\scriptscriptstyle{\mathrm{ot}}}$ | 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 in TS 36.101. |
| power ($P_{ m CMAX}$) | | | 11110 30.101. |
| 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.

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 | | | | | |
| 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 _{channel} | 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 / / 00NO III | | | |

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 | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 3 | |
| N_{oc} | dBm/15 KHz | -98 | |
| \hat{E}_s/N_{oc} | dB | 3 | |
| l 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 | |
| | ich that the call i | is fully allocated and a constant | 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: 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 | | | |
| 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 | | | | |
| | 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: | · · · · · · · · · · · · · · · · · · · | | | | |
| | transmission dedicated to the UE under test is required. | | | | |
| Note 3: See Table A.6.2.1.1-1 for the other parameters. | | | | | |
| Note 4: | te 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 | 3: See Table A.6.2.2.1-1 for the other parameters. | | | |
| Note 4: This test is according | This test is according 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 | | | |
| | dB | 3 | 3 | |
| \hat{E}_{s}/I_{ot} | | _ | | |
| N_{oc} | dBm/15 KHz | -98 | -98 | |
| | I.D. | | | |
| \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 | -65.5 -95 | + |
| KOKF | dBm/15 KHz | - 9 5 -5 | -93 -5 | As defined in clause |
| referenceSignalPower | UDIII/13 KHZ | -5 | -5 | 6.3.2 in TS 36.331. |
| Configured UE transmitted | dPm | 22 | 22 | |
| | dBm | 23 | 23 | As defined in clause 6.2.5 in TS 36.101. |
| power ($P_{ m CMAX,c}$) | | | | 0.2.5 11 13 30.101. |
| PRACH Configuration Index | _ | 4 | 4 | As defined in table |
| 1 103011 Configuration index | _ | | 7 | 5.7.1-2 in TS 36.211. |
| Backoff Parameter Index | - | 2 | 2 | As defined in table 7.2- |
| Dackon i alametel muex | _ | | ۷ | 1 in TS 36.321. |
| Propagation Condition | _ | AWGN | AWGN | 1 111 10 00.021. |
| Note to CONO de all le aveced | I | AVVGIN | AVVGIN | <u> </u> |

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.

Io level has been derived from other parameters for information purpose. It is not a settable parameter.

RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Note 2:

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 |
| | | OGII 1 | | 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 |
| OCNO Dettern | | OP.1 TDD | OD 4 TDD | TAGs |
| OCNG Pattern | - | | 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 |
| PBCH_RA | 40 | | | 4.2-2 in TS 36.211. |
| PBCH_RB | dB | | | |
| PSS_RA | dB | | | |
| SSS_RA | dB 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 | 3 | 3 | |
| N_{oc} | dBm/15 KHz | -98 | -98 | |
| \hat{E}_{s}/N_{cc} | dB | 3 | 3 | |
| lo Note 2 | dBm/9 MHz | -65.5 | -65.5 | |
| RSRP Note 3 | dBm/15 KHz | -05.5 -95 | -65.5 -95 | |
| | dBm/15 KHz | - 9 5 -5 | -55 | 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 | - | 53 | 53 | As defined in table 5.7.1-3 in TS 36.211. |
| Backoff Parameter Index | - | 2 | 2 | As defined in table |
| | | A14/21/ | A14/01/ | 7.2-1 in TS 36.321. |
| Propagation Condition | - | AWGN | AWGN | |

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 F | 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 | | | | |
| ${ m \hat{E}}_{ m s}/{ m I}_{ m ot}$ | 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 spectral density is ac | | ll is 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.

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 | | | |
| $\mathbf{\hat{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 4 | 4 | |
| $N_{oc}^{ m Note 3}$ | dBm/15 kHz | -9 | 8 | |
| \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 | |

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 | 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 | GSM cells are provided in the |
| | | ARFCN 1 | "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

| Parameter | Unit | Cell 1 | | | |
|--|-------------------|-----------------------------------|---------------------------|--|--|
| | | T1 | T2 | | |
| E-UTRA RF Channel Number | | 1 | | | |
| BWchannel | MHz | 10 |) | | |
| OCNG Pattern defined in | | | | | |
| A.3.2.1.1 (OP.1 FDD) | | OP.1 F | 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 | -98 | 3 | | |
| RSRP | dBm/15 kHz | -94 | -94 | | |
| SCH_RP | dBm/15 kHz | -94 | -94 | | |
| Propagation Condition | | AWGN | | | |
| Note 1: OCNG shall be used spectral density is ac | hieved for all OF | is fully allocated and a constant | t total transmitted power | | |

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:

 $T_{connection_release_redirect_GERAN} = T_{RRC_procedure_delay} + T_{identify_GERAN} + T_{SI_GERAN} + T_{RA}$

 $T_{RRC_procedure_delay} = 110$ 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.

 $T_{SI\text{-}GERAN} = 0$; 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 | | 6 | As specified in table 4.2.1 in TS 36.211. The |
| | | O | 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 T | 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 | 7 | | | |
| PDSCH_RB | dB | | | | |
| OCNG_RA ^{Note 1} | dB | | | | |
| OCNG_RB ^{Note 1} | dB | | | | |
| $\hat{E}_{_{\mathrm{s}}}/I_{_{\mathrm{ot}}}$ | 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 spectral density is ac | hieved for all OF | ll is fully allocated and a constant DM 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.6.3.4.1-3: 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 | | | | | |
| 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 | | | | |

- 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 | | 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 | | | AW | 'GN | • |
| | | | | | |

- 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.

 $T_{identify\text{-}UTRA\ TDD} = 500$ 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.

 $T_{RA} = 40 \text{ms}$. 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

| Unit | Cell | 1 | | | |
|------------|---|--|--|--|--|
| | T1 | T2 | | | |
| | 1 | | | | |
| MHz | 10 | | | | |
| | OP 1 5 | EDD | | | |
| | OF.11 | -00 | | | |
| dB | | | | | |
| dB | | | | | |
| | | | | | |
| dB | | | | | |
| dB | | | | | |
| dB | 0 | | | | |
| dB | | | | | |
| dB | 4 | 4 | | | |
| dBm/15 kHz | -98 | 3 | | | |
| dB | 4 | 4 | | | |
| dBm/15 kHz | -94 | -94 | | | |
| dBm/15 kHz | -94 | -94 | | | |
| | AWG | SN . | | | |
| | MHz dB | T1 MHz OP.1 F 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: 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.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 | | | AW | GN | |
| | | | | | |

- 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.

 $T_{identify-UTRA\ TDD} = 500$ 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.

 $T_{RA} = 40 \text{ms}$. 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 | | DwPTS | |
| | | 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 | | | AW | GN | | |

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.

 $T_{RA} = 40$ 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 | Jnit 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 | 1 | | | | | |
| 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 | | AWG | iN | | | | |

- 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 | | 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.6.3.8.2 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.

 $T_{identify\text{-}UTRA\ TDD} = 500$ 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 (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 | |
| 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

| Unit | Cell 1 | | | | |
|------------|---|--|--|--|--|
| | T1 | T2 | | | |
| | 1 | | | | |
| MHz | 10 | | | | |
| | | | | | |
| | OP.1 F | FDD | | | |
| dB | | | | | |
| dB | 0 | | | | |
| dB | | | | | |
| dB | 4 | 4 | | | |
| dBm/15 kHz | -98 | | | | |
| dB | 4 | 4 | | | |
| dBm/15 kHz | -94 | -94 | | | |
| dBm/15 kHz | -94 | -94 | | | |
| | AWG | BN | | | |
| | MHz dB | T1 MHz OP.1 F dB dB dB dB dB dB dB dB dB d | | | |

- 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 | | -0.94 | 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

το ι_{or}.

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

 $T_{RRC procedure delay} = 110 \text{ ms}$

 $T_{identify-UTRA\ FDD} = 500\ ms$

 $T_{SI-UTRA\ FDD}$ = 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."

 $T_{identify-GERAN} = 1000$ 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 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 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 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 (BW _{channel}) | MHz | 10 | |
| DRX | | OFF | |
| Monitored GSM cell list size | | 6 GSM neighbour including ARFCN 1 | Only the list of GERAN carrier frequencies is 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 7 | ΓDD | |
| 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 | | 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.6.3.11.1-3: 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."

 $T_{identify-GERAN} = 1000$ 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 | | 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-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 T | -DD | |
| A.3.2.2.1 (OP.1 TDD) | | OP.11 | 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 | |
| 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 | | AWG | SN . | |
| Note 1: OCNG shall be use | ad such that the call is | fully allocated and a constant | total transmitted nower | |

- 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 | | 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.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 | 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 | | | | | |
| OCNG_RA ^{Note3} | | | | | |
| OCNG_RB ^{Note3} | | | | | |
| 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 |
| | 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.7.1.1-3.

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 ports used for SRS 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 clause 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 | 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 | | |
| IO | 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

| Field | | Va | 0 | | | | |
|--|---------------------------|-------|---|-----------|---|--|--|
| Field | Test 1 Test 2 Test 3 Test | | Test 4 | - Comment | | | |
| srsBandwidthConfiguration | bw5 | bw5 | bw7 | bw5 | | | |
| srsSubframeConfiguration | sc3 | sc3 | sc3 | sc3 | Once every 5 subframes | | |
| ackNackSrsSimultaneousTr ansmission | 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 | 325 | SRS periodicity of 10, 80, 10 and 320 ms for Test 1, 2, 3 and 4 respectively. | | |
| transmissionComb | 0 | 0 | 0 | 0 | | | |
| cyclicShift | cs0 | cs0 | cs0 | cs0 | No cyclic shift | | |
| SRS-AntennaPort | | aı | Number of antenna ports used for SRS transmission | | | | |
| Note: For further information see clause 6.3.2 in TS 36.331. | | | | | | | |

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 | | | | |
|--|---------|---------|---------|--|--|--|--|
| 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 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

| Donomotor | I Imit | | 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 | | Cell 1 | Cell 1 | Cell 1 | | | | |
| Active SCell | | | | | 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 PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RB OCNG_RA OCNG_RB OCNG_RB | dB | 0 | 0 | 0 | 0 | 0 | 0 | |
| N_{oc} | dBm/15 kHz | -98 | -98 | -98 | -98 | -98 | -98 | |
| \hat{E}_{s}/I_{ot} | dB | 3 | 3 | 3 | 3 | 3 | 3 | |
| \hat{E}_s/N_{oc} | dB | 3 | 3 | 3 | 3 | 3 | 3 | |
| Io ^{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 | |
|--|--------|--------|--------|--------|--------|--------|--|--|
| rieiu | 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 information see clause 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 | Test 2 | | Test 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 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

| Downwater | l lmi4 | 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 ^{Note} | 640 ^{Note} / | OFF | 80 ^{Note} / | 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} | | וטטו | 100 | 100 | 100 | 100 | 100 |
| 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 | | U | U | U | | U | U |
| PDCCH_RA | | | | | | | |
| PDCCH_RB | | | | | | | |
| OCNG_RA ^{Note5} | | | | | | | |
| OCNG_RB ^{Note5} | | | | | | | |
| M | dBm/15 | -98 | -98 | -98 | -98 | -98 | -98 |
| N_{oc} | kHz | -90 | -90 | -90 | -90 | -90 | -90 |
| $\hat{E}_{\scriptscriptstyle \mathrm{s}}/\mathrm{I}_{\scriptscriptstyle \mathrm{ot}}$ | 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 appoint subframe | | | | | /(00014 | /(00014 | / () () () |

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

| | Field | | Cell 1 | | | | Cell 2 | | | Comment | | |
|----------------------|-------------------------|-------------------|-------------|---------|------|--------|--------|----|------------|---|---|-------|
| | Field Test 1 | T ēe sti 1 | Test 2 | Tes | t 3 | Test 1 | Test 2 | Те | st 3 | Tset | 3 | Tset3 |
| srsBandv | vidthConfiguration | bw5 | bw5 | bw | /5 | bw5 | bw5 | b | <i>N</i> 5 | | | |
| srsSubfra | ameConfiguration | sc3 | sc3 | sc | :3 | sc3 | sc3 | s | с3 | Once every 5 subframes | | |
| ackNacks Transmis | SrsSimultaneous sion | FALSE | FALSE | FAL | .SE | FALSE | FALSE | FA | LSE | | | |
| srsMaxU | pPTS | FALSE | FALSE | FAL | .SE | FALSE | FALSE | FA | LSE | | | |
| srsBandv | vidth | 0 | 0 | 0 |) | 0 | 0 | | 0 | No hopping | | |
| srsHoppii | ngBandwidth | hbw0 | hbw0 | hbv | w0 | hbw0 | hbw0 | hb | w0 | | | |
| frequency | yDomainPosition | 0 | 0 | 0 |) | 0 | 0 | | 0 | | | |
| duration | | TRUE | TRUE | TRI | UE | TRUE | TRUE | TR | UE | Indefinite duration | | |
| Srs-Confi | igurationIndex | 15 | 85 | 32 | 25 | 15 | 85 | 3 | 25 | SRS periodicity of 10, 80 ms and 320ms for Test 1, 2 and 3, respectively. | | |
| transmiss | sionComb | 0 | 0 | 0 |) | 0 | 0 | | 0 | | | |
| cyclicShif | ft | cs0 | cs0 | cs | 0 | cs0 | cs0 | С | s0 | No cyclic shift | | |
| srsAnteni | naPort | an1 | an1 | an | 11 | an1 | an1 | а | n1 | 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 | | | | | |
|-------------------------------|--|---------|---------|---------|--|--|--|--|--|
| rieid | 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

| Parameter | Unit | | Cell 1 | | Cell 2 | | | |
|---|---------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
| Parameter | Offic | 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 | |
| Io ^{Note6} | dBm/18 MHz | -62.5 | -62.5 | -62.5 | N/A | N/A | N/A | |
| IO | 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 | Cell 1 Cell 2 | | Cell 1 Cell 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 | | | | | |
| longDRX-CycleStartOffset | sf80 | sf80 | | | | | |
| shortDRX | disable | disable | | | | | |
| Note: For further informa | | | | | | | |

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

| E-UTRA RF Channel Number | |
|---|-------|
| Channel Bandwidth (BW _{channel}) MHz 10 10 10 E-UTRA RF Channel Number 1 1 1 2 Active PCell Cell 1 Cell 1 Cell 2 Cell 2 Active SCell Cell 2 Cell 3 Cell 3 Cell 4 Cell 5 Cell 2 Cell 3 Cell 4 Cell 4 Cell 5 Cell 2 Cell 4 Cell 5 Cell 2 Cell 4 Cell 5 Ce | st 2 |
| E-UTRA RF Channel Number | 2 |
| Active PCell | 0 |
| Active SCell | 2 |
| TAG configuration | |
| Special subframe configuration Special subframe Special subframe | ll 2 |
| Configuration Note1 | AG |
| Uplink-downlink configuration Note Note | 3 |
| Uplink-downlink configuration Notes DRX cycle ms | |
| DRX cycle | 1 |
| Reference measurement channel | lote7 |
| channel Note3 OP.2 TDD OP.2 TDD <th< td=""><td></td></th<> | |
| OCNG Pattern Note4 OP.2 TDD OP.2 TDD <td>TDD</td> | TDD |
| OCNG Pattern Note4 OP.2 TDD OP.2 TDD <td></td> | |
| PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RANote5 OCNG_RBNote5 Noc dBm/15 kHz -98 -98 -98 | TDD |
| PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RANote5 OCNG_RBNote5 Noc dBm/15 kHz -98 -98 -98 |) |
| SSS_RA | |
| PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RANOte5 OCNG_RBNote5 Noc dBm/15 kHz -98 -98 -98 | |
| PHICH_RA 0 0 PHICH_RB 0 0 PDCCH_RA 0 0 PDCCH_RB 0 0 OCNG_RA OCNG_RA 0 OCNG_RB 0 0 OCNG_RB 0 0 Ac 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 C 0 0 | |
| PHICH_RB 0 0 PDCCH_RA 0 0 PDCCH_RB 0 0 OCNG_RA OCNG_RA 0 OCNG_RA 0 0 OCNG_RB 0 0< | |
| PRICH_RB | 0 |
| PDCCH_RB | J |
| OCNG_RA ^{Note5} OCNG_RB ^{Note5} OCNG_RB ^{Note5} dBm/15 kHz -98 -98 - | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | |
| N_{oc} dBm/15 kHz -98 -98 -98 -98 | |
| <u> </u> | 98 |
| $\hat{\mathbf{E}}_{_{\mathrm{s}}}/\mathbf{I}_{_{\mathrm{ot}}}$ dB 3 3 | 3 |
| \hat{E}_s/N_{oc} dB 3 3 | 3 |
| Io ^{Note6} dBm/965.565.565.56 | 5.5 |
| Propagation condition - AWGN AWGN AWGN AV | 'GN |

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 | С | ell 1 | C | 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 MHz | -62.5 | -62.5 | -62.5 | -62.5 |
| Note 1: lo level has been derived | | parameters for in | formation 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 Ce | | 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 | | | | |
| PHICH_RB | dB | 7 | | | |
| PDCCH_RA | dB | | 0 | | |
| 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.

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 (T _A) 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 Note2 | | | 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 | | 0 |
| 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 | 331. |

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 | | | |
|---|--|---|----------------------------------|--|--|--|
| PDSCH parameters | | DL Reference Measurement Channel R.5 FDD | As specified in clause A.3.1.1.1 | | | |
| PCFICH/PDCCH/PHICH DL Reference Measurement Channel parameters R.11 FDD | | As specified in clause A.3.1.2.1 | | | | |
| Note 1: For the reference | e 1: For the reference measurement channels, see clause A.3.1. | | | | | |
| Note 2: See Table A.7.2.1.1-1 for the other parameters. | | | | | | |
| Note 3: This test is accor | ding to the | e principle defined in section A.3.7.2 | | | | |

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 (<i>T_A</i>) 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 | | | | | |
|--|---------------|-------|----------|-------|-------|-------|--|
| | <u> </u> | Cell1 | | | ell2 | | |
| | | 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 FDD | |
| in A.3.2.1.1 (OP.1 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 | | 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 | | | -6 | §5.5 | |
| Propagation Condition | | | AWGN | | AV | VGN | |
| | | | | | | | |

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 (T _A) 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 | Value | | | | |
|--|------------|----------|----------|--|--|--|
| | | 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 1DD | 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 | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 3 | 3 | | | |
| N_{oc} | dBm/15 KHz | -98 | -98 | | | |
| \hat{E}_s/N_{oc} | dB | 3 | 3 | | | |
| Io ^{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 class | | | | | | | | |

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 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 -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 | Value | | | | |
|----------------------------------|------------|--------|----------|-----|----------|--|
| | | Cell 1 | | Ce | II 2 | |
| | | T1 | T2 | T1 | T2 | |
| BW _{channel} | MHz | 20 | | 10 | | |
| OCNG Patterns defined in A.3.2.2 | | OP.7 | OP.7 TDD | | OP.1 TDD | |
| Io ^{Note4} | dBm/18 MHz | -62.5 | | N/A | | |
| 10 | dBm/9 MHz | N/A | A | -65 | 5.5 | |

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

| Pa | 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 | | | Cell 1 | Cell 1 | Cell 1 | Cell 1 | Cell 1 is on E-UTRA RF channel number 1 |
| CP length | | | Normal | Normal | Normal | Normal | |
| E-UTRĂ 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 | |
| | atrix 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 filterir | 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 |
| Periodic CQI 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 | | ms | 2 | 2 | 2 | 2 | Minimum CQI reporting periodicity |
| Propagation of | hannel | | 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 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 | T3 | T1 | T2 | T3 | |
| 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 | | -98 | | | -98 | | |
| ' 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 | Т3 | T1 | T2 | Т3 | |
| 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 | | 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 | -1.4 | -5.5 | -11.5 | -2.3 | -6.2 | -12.2 | |
| N_{oc} | dBm/15 | | | | -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.

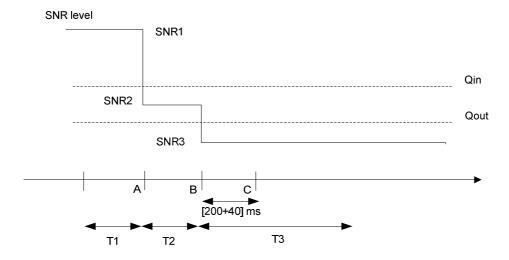


Figure A.7.3.1.1-1 SNR variation for out-of-sync testing

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

| Parameter | | Unit | Jnit Value | | Comment | |
|-----------------------------|--|------|------------|----------|--|--|
| | | | Test 1 | Test 2 | | |
| PCFICH/PDC0 parameters | PCFICH/PDCCH/PHICH parameters | | 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. | |
| | 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 | 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 | |
| N A DDOOLL/DOELOLL | - 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.7.3.2.1-2: 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 | | | | | 5 |
| E-UTRA RF Channel | | | | 1 | | | 1 | | | | | |
| Number | | | | | | | | | | | | |
| BW _{channel} | MHz | | | 10 | | | 10 | | | | | |
| Correlation Matrix | | | | 1x2 Low | 1 | | | | 2x2 Lo | w | | |
| and Antenna | | | | | | | | | | | | |
| Configuration | | | | | | | | | | | | |
| OCNG Pattern | | | | | | | | | | | | |
| defined in A.3.2.1 | | | (| OP.2 FD | D | | | | OP.2 F | DD | | |
| (FDD) | | | | | | | | | | | | |
| ρα, ρΒ | | | | 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 | | | | | | | | | | | ļ |
| PDSCH_RA | dB | | | | | | | | | | | ļ |
| PDSCH_RB | dB | | | | | | | | | | | ļ |
| OCNG_RA ^{Note 1} | dB | | | | | | | | | | | ļ |
| 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 | -7.3 | | -2.3 |
| N_{oc} | dBm/15 | -98 | • | | • | • | -98 | | • | • | | |
| 1 oc | kHz | | | | | | | | | | | |
| Propagation condition | | ETU 7 | 0 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 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.

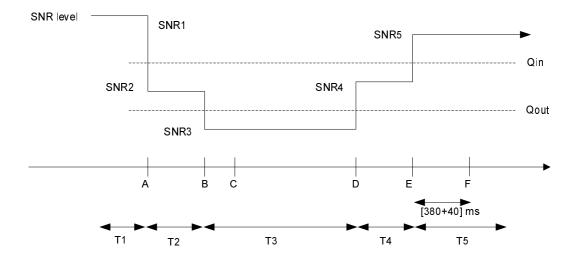


Figure A.7.3.2.1-1 SNR variation for in-sync testing

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

| Parameter | | Unit | | Va | lue | | Comment |
|---|--------------------------------------|------|-----------|-----------|-----------|-----------|---|
| | | | Test 1 | Test 2 | Test 3 | Test 4 | 1 |
| PCFICH/PD0 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 parameters | | | OP.2 TDD | OP.2 TDD | OP.2 TDD | OP.2 TDD | As specified in clause A.3.2.2.2. |
| Active cell | | | Cell 1 | Cell 1 | Cell 1 | Cell 1 | Cell 1 is on E-UTRA RF channel number 1 |
| CP length | | | Normal | Normal | Normal | Normal | |
| | 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 | |
| Correlation Matrix and Antenna Configuration | | | 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 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 | |

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.: | | | |
| N_{oc} | dBm/15 | | -98 | | | -98 | | |
| | kHz | | | | | | | |
| 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 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
- 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 | 1 | | | |
| 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 _Α , ρ _Β | | | 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 | | | 1 | | • | | | | |
| SNR Note 8 | dB | -1.4 | -5.3 | -11.3 | -2.3 | -5.9 | -11.9 | | | |
| N_{oc} | dBm/15 | -98 | | | -98 | | | | | |
| | kHz | | | | | | | | | |
| Propagation condition | | ETU 70 | 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.

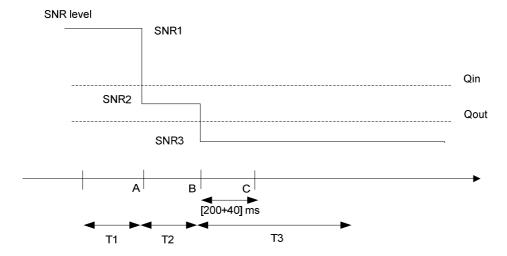


Figure A.7.3.3.1-1. SNR variation for out-of-sync testing

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

| Parameter | | Unit | Va | lue | Comment |
|-----------------------------|--|------|----------|----------|--|
| | | | Test 1 | Test 2 | |
| PCFICH/PDCC 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 parame | ters | | 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 |
| (1010 1) | Aggregation level | CCE | 4 | 4 | PDCCH/PCFICH transmission parameters are as specified in |
| | ρ _Α , ρ _Β | | 0 | -3 | 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 | 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 are as specified in |
| | $ ho_{A}, ho_{B}$ | | 0 | -3 | 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 |) | | 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 | |
| ТЗ | 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 | | | | | | Test 2 | | | | | | |
|--------------------------------------|------|----------------|--|------|------------|--|----|----------------|------|-----|--|--|--|--|
| | | T1 T2 T3 T4 T5 | | | | | | T1 T2 T3 T4 T5 | | | | | | |
| E-UTRA RF Channel | | 1 | | | | | | 1 | | | | | | |
| Number | | | | | | | | | | | | | | |
| BW _{channel} | MHz | | | | 0 | | | | | 0 | | | | |
| Correlation Matrix | | | | 1x2 | Low | | | | 2x2 | Low | | | | |
| and Antenna | | | | | | | | | | | | | | |
| Configuration | | | | | | | | | | | | | | |
| Special subframe configuration Note1 | | | | (| 6 | | | | (| 6 | | | | |
| | | | | | | | | | | | | | | |
| Uplink-downlink | | | | • | 1 | | | | • | 1 | | | | |
| configuration Note2 | | | | | | | | | | | | | | |
| OCNG Pattern | | | | 000 | TDD | | | | 00.0 | | | | | |
| defined in A.3.2.2 | | | | OP.2 | TDD | | | | OP.2 | TDD | | | | |
| (TDD) | | | | | ` | | | | | | | | | |
| ρα, ρΒ | ID. | | | |) | | -3 | | | | | | | |
| PCFICH_RB | dB | | | | 4 | | 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 | | | | | | -98 | | | | | | |
| Propagat | tion condition | | ETU 7 | 70 Hz | | | | ETU 7 | 0 Hz | | | | | | | |
| Note 1: | Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211. | | | | | | | | | | | | | | | |
| Note 2: | For the uplin | k-downlink co | onfigurati | on see t | able 4.2- | 2 in TS | 36.211. | | | | | | | | | |
| Note 3: | OCNG shall power specti | be used such ral density is | | | | | fully allo | cated a | nd a con | stant tota | al transr | nitted | | | | |
| Note 4: | | esources for (| | | | | UE prior | to the s | tart of tir | ne period | d T1. | | | | | |
| Note 5: | The timers a | nd layer 3 filt | ering rela | ated para | ameters a | are confi | igured pr | ior to the | e start o | f time pe | riod T1. | | | | | |
| Note 6: | | ontains PDC0 | | | | | | | | | | | | | | |
| Note 7: | • | correspond to | | | | | | | | | | | | | | |
| Note 8: | The SNR in t | time periods | T1, T2, T | | | | • | | | - | | 5 | | | | |

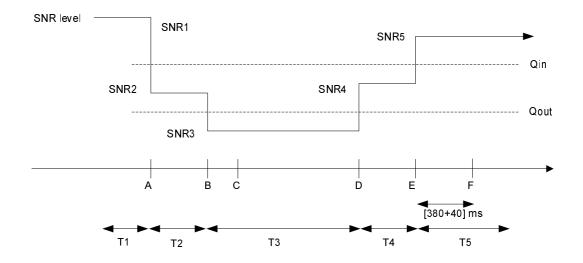


Figure A.7.3.4.1-1. SNR variation for in-sync testing

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

| Parameter | | Unit | Value | | Comment |
|----------------------------------|--------------------------------------|------|-----------|---------------|--|
| | | | Test 1 | Test 2 | |
| 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 |
| | Periodic CQI 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 | | | | | | | | |
| defined in A.3.2.1 | | | OP.2 FDD | | | OP.2 FDD | | |
| (FDD) | | | | | | | | |
| ρΑ, ρΒ | | | -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 | | | |
| | | 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 a period T1. | nd layer 3 filter | tering 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 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.7.3.5.1-1.

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. |

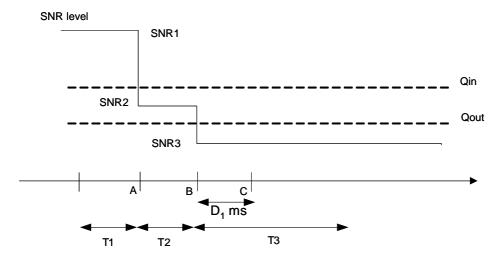


Figure A.7.3.5.1-1 SNR variation for out-of-sync testing in DRX

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 | HICH 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 channel number 1 |
| CP length | | | Normal | Charmer Humber 1 |
| E-UTRA RF Chann | el Number | | 1 | One E-UTRA FDD carrier frequency is used. |
| E-UTRA Channel B (BW _{channel}) | andwidth | MHz | 10 | noquonoy io dood. |
| Antenna Configurat | ion | | 1x2 | |
| , miemie eemigene | 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 | CC E | 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 | 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 T5 | | S | 0.4 4 | |
| | DCTICH correspond | S line at the th | - | Lout 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 | | | | | |
| ΡΑ, ΡΒ | | | | 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 ^{Note1} | dB | | | | | | |
| OCNG RB ^{Note1} | dB | | | | | | |
| SNR Note 8 | dB | -4.7 | -9.5 | -13.5 | -8.7 | -4.7 | |
| N_{oc} | dBm/15 kHz | -98 | | | | | |
| Propagation condition | | AWGN | | | | | |
| Note 1: OCNG shall be used | such that the | resources in | cell # 1 are f | ully allocated | and a consta | int 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. |

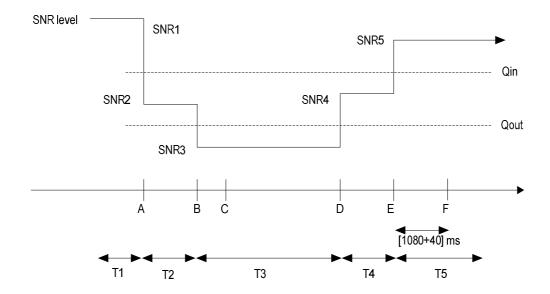


Figure A.7.3.6.1-1 SNR variation for in-sync testing in DRX

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 | ue | Comment |
|--|--------------------------------------|------|--------------------|---------------|--|
| | | | Test 1 | Test 2 | |
| PCFICH/PDCCH/PHICH parameters | | | 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 Mantenna 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 | ng | | 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 | 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 | |
| | COLUDOFICIA | | line at the second | | |

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 | | | | | | | |
| defined in A.3.2.2 | | | OP.2 TDD | | OP.2 TDD | | |
| (TDD) | | | | | | | |
| ра, рв | | -3 | | | 0 | | |
| PCFICH_RB | dB | | 1 | | 4 | | |
| PDCCH_RA | dB | | 1 | | 4 | | |
| PDCCH_RB | dB | | 11 | | 4 | | |
| PBCH_RA | dB | | | | | | |
| PBCH_RB | dB | | | | | | |
| PSS_RA | dB | | | | | | |
| SSS_RA | dB | | 0 | | | 0 | |
| PHICH_RA | dB | | -3 | | 0 | | |
| PHICH_RB | dB | | | | | | |
| PDSCH_RA | dB | | | | | | |
| PDSCH_RB | dB | | | | | | |
| OCNG_RA ^{Note3} | dB | | | | | | |
| OCNG_RB ^{Note3} | dB | <u> </u> | | | | • | 1 |
| SNR Note 8 | dB | -2.3 | -5.9 | -11.9 | -5.1 | -9.1 | -13.1 |
| N_{oc} | dBm/15 | -98 | | -98 -98 | | | |
| | kHz | | | | | | |
| Propagation condition | | 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 |
|--------------------------|---------|---------|------------------------------------|
| rieiu | 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.7.3.7.1-4: TimeAlignmentTimer - Configuration for E-UTRAN TDD out-of-sync testing

| Field | Test1 | Test2 | Comment |
|--------------------|----------|----------|---|
| rieiu | Value | Value | |
| 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. |

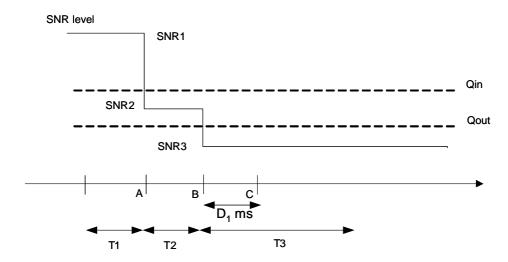


Figure A.7.3.7.1-1 SNR variation for out-of-sync testing in DRX

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/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 | | | 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 | ion | | 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 report | | | PUCCH 1-0 | As defined in table 7.2.2-1 in TS 36.213. |
| CQI reporting periodicity | | ms | 1 | Minimum CQI reporting periodicity |
| | Propagation channel | | AWGN | |
| T1 | | S | 4 | |
| T2 | | S | 1.6 | |
| T3 | | S | 1.46 | |
| T4 T5 | | S | 0.4 | |
| | PCFICH correspond | ing to the | | l out 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_A , ρ_B | | | | 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 | | | | | | | | |
| SNR Note 8 | dB | -5.1 | -9.1 | -13.1 | -9.1 | -5.1 | | | |
| N_{oc} | dBm/15 | | | -98 | | • | | | |
| 1 oc | kHz | | | | | | | | |
| Propagation condition | | | | AWGN | | | | | |
| Note 1: For the special subfr | ame configurat | tion see table | e 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
- 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. |

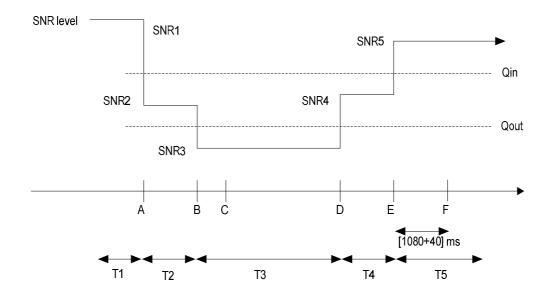


Figure A.7.3.8.1-1 SNR variation for in-sync testing in DRX

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

| 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 | As specified in clause A.3.2.1.6. | | |
| Serving cell (F | | | Cell 1 | Cell 1 is on E-UTRA RF channel number 1 | | |
| Neighbor cell | <u> </u> | | Cell 2 | Aggressor cell on E-UTRA RF channel number | | |
| Neighbor cell | ABS | | Non-MBSFN ABS | As defined in Table A.3.4.1.2-1 | | |
| configuration CP length | | | Normal | | | |
| E-UTRA RF C | hannel | | 1 | One E-UTRA FDD carrier frequency is used. | | |
| Number | TIAITITE! | | ' | One E-OTTAT DD camer frequency is used. | | |
| | nel Bandwidth | MHz | 10 | | | |
| Correlation Ma | atriv and | | 2x2 Low | Correlation Matrix and Antenna Configuration | | |
| Antenna Confi | | | ZAZ LOW | 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 | | | 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 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 | | 3 μs | Synchronous cells | | |
| T1 | | S | 1 | | | |
| T2 | | S | 0.4 | | | |
| T3 | | S | 0.5 | | | |
| Physical cell II | D PCI | | (PCI _{cell1} -PCI _{cell2})mod3!= | Cell IDs are chosen such that CRS from cells 1 and 2 do not overlap in frequency | | |
| ABS pattern | | | 10000000100000001000 | FDD ABS Pattern Info IE, as defined in TS | | |
| ADO pattern | | | 0000100000010000000 | 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. | | |
| | measurement | | '10000000100000001000 | Time domain measurement resource restriction | | |
| | resource restriction pattern | | | | | |
| | | | 00001000000010000000 | pattern for serving cell measurement signalled | | |
| | | | 00001000000010000000 | to the UE in message | | |
| | | | 00001000000010000000 | | | |

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 | 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.3.2.1.6 | | | OP.6 FDD | | | OP.6 FDD | |
| (FDD) | | | | | | | |
| ρα, ρв | | | -3 | | | -3 | |
| PCFICH_RB | dB | | 1 | | Non-ABS and ABS subframe channel powers defined in | | |
| PDCCH_RA | dB | | 1 | | | | |
| PDCCH_RB | dB | | 11 | | Table A.3.4.1.2-1. | | |
| 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 ^{Note1} | dB | | | | | | |
| OCNG RB ^{Note1} | dB | | | | | | |
| SNR Note 6 | dB | -1.3 | -5.4 | -12.4 | | 5 | |
| N_{oc} | dBm/15 | -98 -98 | | | | | |
| | 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. 9.1-1.

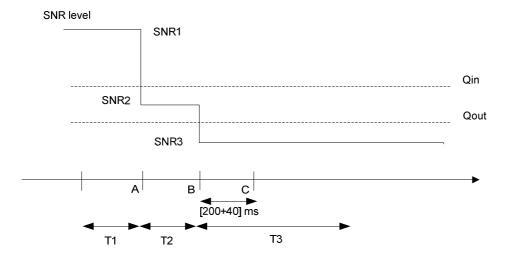


Figure A.7.3.9.1-1 SNR variation for out-of-sync testing

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 neigbhor 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 _Α , ρ _Β | | -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 | 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 | | | | | | | | | |
| 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 | | | -3 | | -3 | | | | |
| PCFICH_RB | dB | | 1 | | Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.2-1. | | | | |
| PDCCH_RA | dB | | 11 | | | | | | |
| 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 3} | dB | | | | | | | | |
| OCNG RB ^{Note 3} | dB | | | | | | | | |
| SNR Note 8 | dB | -1.3 | -5.4 | -12.4 | | 5 | | | |
| N_{oc} | dBm/15 | -98 -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.

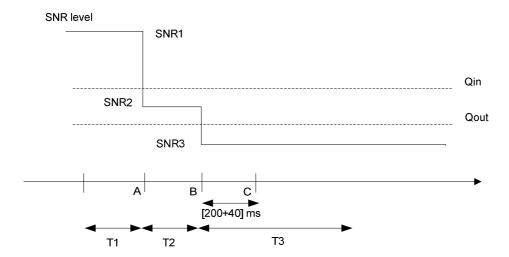


Figure A.7.3.10.1-1 SNR variation in active cell for out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS

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/PD | CCH/PHICH | t | R.9 FDD | As specified in clause A.3.1.2.1. |
| parameters | 00.1/1.110.1 | | 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 | | | Cell 2 | Cell 2 is on E-UTRA RF channel |
| | • | | | number 1; Cell 2 generates |
| | | | | interference over restricted |
| NI : 11 | U A D O | | | resources. |
| Neighbor ce configuration | | | Non- MBSFN | As defined in Table A.3.4.1.2-2 |
| Configuration | 1 | | ABS | |
| CP length | | | Normal | |
| E-UTRA RF | Channel | | 1 | One E-UTRA FDD carrier |
| Number | annel Bandwidth | NAL I | 40 | frequency is used. |
| (BWchannel | | MH z | 10 | |
| Correlation N | | _ | 2x2 Low | Correlation Matrix and Antenna |
| Antenna Cor | nfiguration | | | Configuration are defined in TS |
| | I = | | | 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 | Control OFDM | | | corresponding hypothetical |
| on | symbols | | | PDCCH/PCFICH transmission |
| parameter s for the | Aggregation | CC | 4 | parameters are as specified in |
| active cell | level ρΑ, ρΒ | Е | -3 | clause and Table 7.6.1-2 respectively. |
| (Note 1) | Ratio of | dB | -3 | Tospositvely. |
| | PDCCH to RS | l ab | | |
| | EPRE | | | |
| | Ratio of | dB | 1 | |
| | PCFICH to RS EPRE | | | |
| | DCI format | | 1A | As defined in clause 5.3.3.1.3 in |
| | | | | TS 36.212 |
| Out of | Number of Control OFDM | | 3 | Out of sync threshold Qout and |
| sync transmissi | symbols | | | the corresponding hypothetical PDCCH/PCFICH transmission |
| on | Aggregation | CC | 8 | parameters are as specified in |
| parameter | level | Е | | clause 7.6.1 and Table 7.6.1-1 |
| s for active | ρΑ, ρΒ | | -3 | respectively. |
| cell (Note 1) | Ratio of | dB | 1 | |
| ', | PDCCH to RS EPRE | | | |
| | Ratio of | dB | 1 | 1 |
| | PCFICH to RS | | | |
| DDY | EPRE | | OFF | |
| DRX Layer 3 filter | ina | | OFF Enabled | Counters: |
| Layer 3 liller | ii ig | | LIIADICU | N310 = 1; N311 = 1 |
| T310 timer | T310 timer | | 2000 | T310 is enabled |
| T311 timer | T311 timer | | 1000 | T311 is enabled |
| Periodic CQ | I reporting mode | | PUCCH 1- 0 | As defined in table 7.2.2-1 in TS 36.213. |
| CQI reportin | g periodicity | ms | 2 | Minimum CQI reporting |
| | | | | periodicity |
| | petween cells | μs | 3 | |
| Propagation | channel | | ETU30 | |
| T1 T2 | | S S | 0.5 | |
| 14 | | O | J U. 4 | 1 |

| T3 | S | 1.46 | |
|------------------------------|---|-------------------------|------------------------------------|
| T4 | S | 0.4 | |
| T5 | S | 1 | |
| Physical cell ID PCI | | (PCI _{cell1} - | Cell IDs are chosen such that |
| | | PCI _{cell2} | CRS from cells 1 and 2 do not |
| | |)mod3 != 0 | overalp in frequency |
| ABS pattern | | '100000001 | FDD ABS Pattern Info IE, as |
| | | 000000010 | defined in TS 36.423 [28], |
| | | 000000100 | clause 9.2.54. Configured in Cell |
| | | 000001000 | 2. |
| | | 0000' | 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 | | '100000001 | Time domain measurement |
| resource restriction pattern | | 000000010 | resource restriction pattern for |
| | | 000000100 | serving cell measurement |
| | | 000001000 | signalled to the UE in message |
| | | 0000' | measSubframePatternPCell-r10 |
| | | | as defined in TS 36.331, clause |
| Note 1: DDCCH/DCFICH or | | | 6.3.2. |

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.7.3.11.1-2: 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 Lo | OW | | | | | 2x2 Lc | W | |
| and Antenna | | | | | | | | | | | | |
| Configuration | | | | | | | | | | | | |
| PCFICH/PDCCH/PHI | | | | R.9 FI | 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 F | DD | | | | (| OP.6 F | DD | |
| (FDD) | | | | | | | | | | | | |
| ρ _A , ρ _B | | | | -3 | | | | | | -3 | | |
| PCFICH_RB | dB | | | 1 | | | | Non-ABS and ABS subframe | | | | |
| PDCCH_RA | dB | | | -3 | | | | channel powers defined in Table A.3.4.1.2-2. | | | | |
| PDCCH_RB | dB | | | -3 | | | | | F | 1.3.4.1. | 2-2. | |
| PBCH_RA | dB | | | | | | | | | | | |
| PBCH_RB | dB | | | | | | | | | | | |
| PSS_RA | dB | | | | | | | | | | | |
| SSS_RA | dB | | | -3 | | | | | | | | |
| 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 | 0 | | |

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.

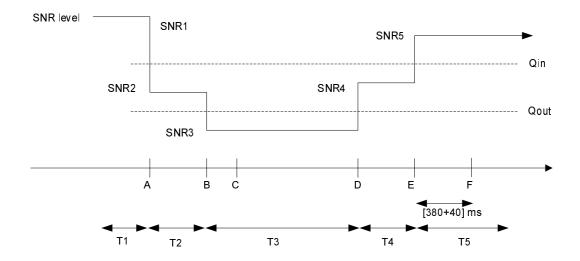


Figure A.7.3.11.1-1 SNR variation in the active cell for in-sync testing under time domain measurement resource restriction

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 Correlation I | | Z | 2x2 Low | Correlation Matrix and |
| Antenna Co | | | ZXZ LOW | Antenna Configuration are |
| / interina oo | inguration | | | 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 | Number of Control OFDM | | 3 | In sync threshold Qin and the |
| on | 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 | ub | ' | |
| | 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 | СС | 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 Ratio of | dB | 1 | - |
| | PCFICH to RS | ub | ' | |
| | EPRE | | | |
| DRX | | | OFF | |
| Layer 3 filter | ing | | Enabled | Counters: |
| T040 :: | | | 0000 | N310 = 1; N311 = 1 |
| T310 timer | | ms | 2000 | T310 is enabled |
| T311 timer | I reporting mode | ms | 1000 PUCCH 1-0 | T311 is enabled As defined in table 7.2.2-1 in |
| I GIIOGIC OQ | r reporting mode | | 1 00011 1-0 | TS 36.213. |
| CQI reportin | g periodicity | ms | 1 | Minimum CQI reporting periodicity |
| Time offset I | petween cells | μS | 3 | periodicity |
| Propagation | | μο | ETU30 | |
| . ropagation | o. idi ii ioi | <u> </u> | 1 = 1 0 0 0 | ! |

| 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 | | 100000000 100000000 | 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. |

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.7.3.12.1-2: 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 | 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 TDI |) | | OP.2 TDD | | | | | | |
| (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 | | | | ı Table | | |
| PDCCH_RB | dB | | | -3 | | | A.3.4.1.2-2. | | | | | | |
| PBCH_RA | dB | <u> </u> | | | | | | | | | | | |
| PBCH_RB | dB | <u> </u> | | | | | | | | | | | |
| PSS_RA | dB | <u> </u> | | | | | | | | | | | |
| SSS_RA | dB | | | | | | | | | | | | |
| PHICH_RA | dB | <u> </u> | | -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 | -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.

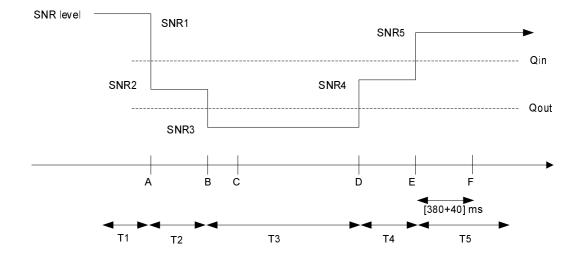


Figure A.7.3.12.1-1 SNR variation in active cell for in-sync testing under time domain measurement resource restriction

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

| Parar | neter | Unit | Value | Comment |
|--------------------------------------|----------------------------------|----------|---|---|
| PCFICH/PDC0 | 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 | |
| 0 : 11/5 | -0 " | | neighbour cell (Cell 2) | O H () E LITRA DE L |
| Serving cell (P | 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 | 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 | 15 1 1 11 | | 10 | |
| 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 | | 3 | Out of sync threshold Qout and the |
| parameters | Control | | | corresponding hypothetical PDCCH/PCFICH |
| (Note 1) | OFDM | | | transmission parameters are as specified in |
| | symbols | CCE | 8 | clause 7.6.1 and Table 7.6.1-1 respectively. |
| | Aggregation level | CCE | | |
| | ρα, ρв | | -3 | |
| | Ratio of | dB | 1 | |
| | PDCCH to | | | |
| | RS EPRE | | | |
| | Ratio of PCFICH to RS EPRE | dB | 1 | |
| DRX | | | OFF | |
| Layer 3 filtering | g | | Enabled | Counters:: N310 = 1; N311 = 1 |
| T310 timer | <u> </u> | ms | 0 | T310 is disabled |
| 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 | - | 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 ID |) PCI | - | (PCI _{cell1} -PCI _{cell2}) mod 3 = | Cell IDs are chosen such that CRS from cells 1 |
| i riyəldal deli iL | J 1 OI | | 0, PCI _{cell1} not equal to | and 2 overlap in frequency |
| | | | PCI _{cell2} | and 2 overlap in nequency |
| ABS pattern | | | '010000010000001000 | FDD ABS Pattern Info IE, as defined in TS |
| | | | | 36.423 [28], clause 9.2.54. Configured in Cell 2. |
| | | | 00000010000001000000' | |
| | | | 00000010000001000000' | The first/leftmost bit corresponds to the PCell |
| | | | 00000010000001000000 | The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN |
| | | | 00000010000001000000' | 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 |
| | | | 00000010000001000000' | 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 |
| Time | | | | 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 n | | | '01000000100000001000 | 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 measurement resource restriction |
| Time domain r resource restri | | | | 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 measurement resource restriction pattern for serving cell measurement signalled |
| | | | '01000000100000001000 | 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 measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePattern- |
| resource restri | ction pattern | Orrespon | '0100000010000001000 00000010000001000000 | 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 measurement resource restriction pattern for serving cell measurement signalled |

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 | 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 _Α , ρ _в | | | -3 | | -3 | | | | |
| PCFICH_RB | dB | | 11 | | Non-ABS and ABS subframe | | | | |
| 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 kHz | | -98 | | -98 | | | | |
| 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.

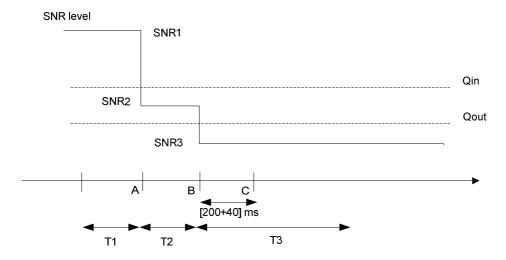


Figure A.7.3.13.1-1 SNR variation for out-of-sync testing

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 | CH/PHICH | | R.9.TDD | 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 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 | D 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 |

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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 TDI | | | | | | |
| ρΑ, ρΒ | | | -3 | | -3 | | | |
| PCFICH_RB | dB | | 1 | | Non-ABS and ABS subframe channel powers defined in | | | |
| PDCCH_RA | dB | | 1 | | | | | |
| 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.

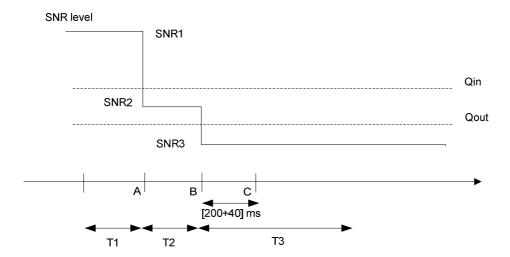


Figure A.7.3.14.1-1 SNR variation for out-of-sync testing

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 | ımeter | Unit | Value | Comment | | | | |
|---------------------------------------|--------------------------------------|------|---|--|--|--|--|--|
| PCFICH/PDCC | | | R.9 FDD | As specified in clause A.3.1.2.1. | | | | |
| parameters | | | | 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 | eters for Cell 1 | | OP.6 FDD | As specified in clause A.3.2.1.6. | | | | |
| OCNG parame | | | OP.9 FDD | As specified in clause A.3.2.1.9. | | | | |
| CP length | | | Normal | | | | | |
| Neighbor cell A configuration | | | MBSFN ABS | | | | | |
| E-UTRA RF C | nannel Number | | 1 | One E-UTRA FDD carrier frequency is used. | | | | |
| E-UTRA Chani (BWchannel) | nel Bandwidth | MHz | 10 | | | | | |
| Correlation Ma Configuration | 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 = | Cell IDs are chosen such that CRS | | | | |
| | | | 0, PCIcell1 not equal to PCIcell2 | from cells 1 and 2 overlap in frequency. | | | | |
| ABS pattern | | | 01000000100000010000 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 | | 010000001000000010000 | 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 | |

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.7.3.15.1-2: 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 | | | | | | Cell 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 Lov | / | | | | 2x2 Lo | W | | |
| and Antenna | | | | | | | | | | | | |
| Configuration | | | | | | | | | | | | |
| OCNG Pattern | | | | | | | | | | | | |
| defined in A.3.2.1 | | | (| OP.6 FD | D | | | (| OP.9 FI | DD | | |
| (FDD) | | | | | | | | | | | | |
| 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.3.4.2.2-2. | | | | | |
| 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 | | | ETUCA | | | | | | | | |
| Propagation condition | | | | ETU30 | | | ETU30 | | | | | |

- 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.

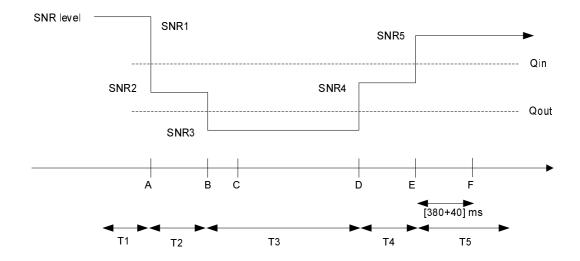


Figure A.7.3.15.1-1 SNR variation in the active cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

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 | ımeter | Unit | Value | Comment |
|---------------------------------------|--------------------------------------|------|---|--|
| PCFICH/PDCC | | | R.9 TDD | As specified in clause A.3.1.2.2. |
| parameters | | | | 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 | eters for Cell 1 | | OP.2 TDD | As specified in clause A.3.2.2.2. |
| OCNG parame | | | OP.6 TDD | As specified in clause A.3.2.2.6. |
| CP length | | | Normal | |
| Neighbor cell A configuration | | | MBSFN ABS | |
| E-UTRA RF CI | nannel Number | | 1 | One E-UTRA TDD carrier frequency is used. |
| E-UTRA Chan (BWchannel) | nel Bandwidth | MHz | 10 | |
| Correlation Ma Configuration | 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 = | Cell IDs are chosen such that CRS |
| · | | | 0, PCIcell1 not equal to PCIcell2 | 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 n | 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 | | | | | Cell 2 | 2 | | | |
|---------------------------------|--------|----------------|------|----------|------|------|---------------------------------|---|---------|----|--|
| | | T1 T2 T3 T4 T5 | | | | T1 | T1 T2 T3 T4 T5 | | | | |
| E-UTRA RF Channel | | 1 | | | | | | 1 | | • | |
| Number | | | | | | | | | | | |
| BW _{channel} | MHz | | | 10 | | | | | 10 | | |
| Correlation Matrix | | | | 2x2 Low | | | | | 2x2 Lc | 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 TDI |) | | | (| OP.6 TI | DD | |
| (TDD) | | | | | | | | | | | |
| ρ _A , ρ _B | | | | -3 | | | | | -3 | | |
| PCFICH_RB | dB | | | 11 | | | 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 | | 1 | | | | | | | | |
| SNR Note 8 | dB | -1.3 | -5.4 | -12.4 | -7.3 | -1.3 | | | 5 | | |
| N_{oc} | dBm/15 | | | -98 | | | -98 | | | | |
| ' 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.

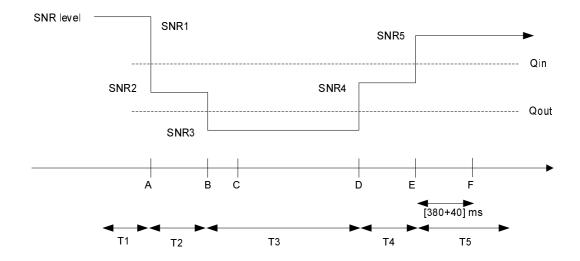


Figure A.7.3.16.1-1 SNR variation in the active cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

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 | | '10000000100000001000 0000100000001000000 | 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' | | | |
| | | | nission parameters need not be included in the | | | |
| Ref | ference Measurem | nent 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 | | 11 | | Non-ABS and | Non-ABS and |
| PDCCH_RA | dB | | 11 | | 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: 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.

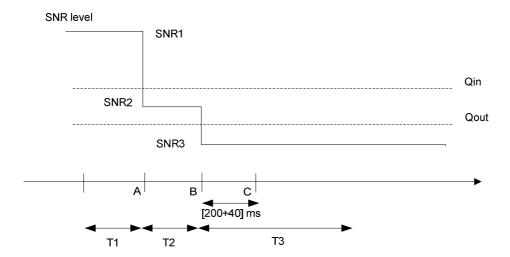


Figure A.7.3.17.1-1 SNR variation for out-of-sync testing

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 |
| | | | 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' | | | |
| | | | nission parameters need not be included in the | | | |
| Re | ference Measurer | nent 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 | Т3 | 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) | | | | | 0 | 0 | | |
| ρα, ρΒ | I.D. | | -3 | | -3 | -3 | | |
| PCFICH_RB | dB | | 1 | | Non-ABS and | Non-ABS and | | |
| PDCCH_RA | dB | | 1 ABS subframe | | ABS subframe | | | |
| PDCCH_RB | dB | | | | channel powers | channel powers | | |
| PBCH_RA | dB | | | | defined in Table A.3.4.1.2-1. | defined in Table A.3.4.1.2-1. | | |
| PBCH_RB | dB | | | | A.3.4.1.2-1. | A.3.4.1.2-1. | | |
| PSS_RA | dB | | | | | | | |
| SSS_RA | dB | | -3 | | | | | |
| 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 | -1.5 -5.2 -13.7 | | | | 4 | 2 |
| N_{oc} | dBm/15 | | -98 | | -98 | | -98 | -98 |
| | kHz | | ETILOGII | | ETIL COLL | FT110011 | | |
| Propagation condition | | <i>c.</i> | 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.

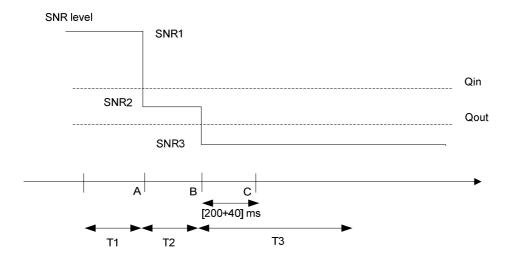


Figure A.7.3.18.1-1 SNR variation for out-of-sync testing

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 |
|--|----------------------------------|------|--|--|--|---|
| - uru | | 0 | | Test 1 | | Johnnent |
| | | | Cell 1 | Cell 2 | Cell 3 | |
| PCFICH/PDC0 parameters | CH/PHICH | | R.9 FDD | R.9 FDD | R.9 FDD | As specified in section 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 | |
| | hannel Number | | 1 | 1 | 1 | One E-UTRA FDD 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 a configuration | ABS | | N/A | Non-MBSFN A | ABS | As defined in Table A.3.4.1.2-2 |
| ABS Pattern Time domain n resource restri | | | '10000001 000000100 000010000 000100000 0' | '10000001 000000100 0 0000100000 001000000 | \(\frac{100000001}{0000000100}\) \(\frac{0}{0}\) \(\frac{0000100000}{0010000000}\) \(\frac{1}{0}\) \(\frac{1}\) \(\frac{1}{0}\) \(\frac{1}\) \(\frac{1}\) \(\f | 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 measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCe II-r10 as defined in TS |
| CRS assistant information | physCellId antennaPorts Count | | N/A | see PCI conditions below an2 | see PCI conditions below an2 | 36.331, clause 6.3.2. The CRS assistance information is provided for 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 bet (With respect t | | us | 0 | 3 | 2 | |
| | ft between cells | Hz | 0 | 300 | -100 | |
| Physical Cell II | | | PCI _{cell1} | $ \begin{array}{l} (PCI_{cell1}\text{-}\\ PCI_{cell2})\\ mod3=0,\\ PCI_{cell1} \ not\\ equal\ to \end{array} $ | (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 | |
| | Ratio of PCFICH to RS EPRE | dB | 1 | | | 7.6.1 and Table 7.6.1-1 respectively. | |
| 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 | 2 | 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.7.3.19.1-2: Cell specific test parameters for E-UTRAN FDD in-sync radio link monitoring test

| Parameter | Unit | Test 1 | | | | | | |
|---------------------------|--------|--------|------|----------|------|------|----------|----------------|
| | | | | Cell1 | | | Cell2 | Cell3 |
| | | T1 | T2 | 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 FDD |) | | OP.6 FDD | OP.6 FDD |
| (FDD) | | | | | | | | |
| ρΑ, ρΒ | | | | -3 | | | -3 | -3 |
| PCFICH_RB | dB | | | 1 | | | | ABS subframe |
| PDCCH_RA | dB | | | | | | | ers defined in |
| PDCCH_RB | dB | | | | | | Table A. | 3.4.1.2-2. |
| PBCH_RA | dB | | | | | | | |
| PBCH_RB | dB | | | 0 | | | | |
| 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.7.3.19.1-1.

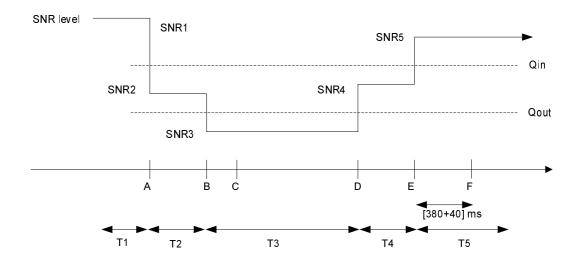


Figure A.7.3.19.1-1 SNR variation for in-sync testing

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

| Parai | meter | Unit | | Value | | Comment | |
|--|----------------------------------|------|--------------------------------|--|--|---|--|
| | | | | Test 1 | | j | |
| | | | Cell 1 | Cell 2 | Cell 3 | | |
| PCFICH/PDCC parameters | CH/PHICH | | 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 | | |
| | nannel Number | | 1 | 1 | 1 | One E-UTRA TDD carrier frequency is used. | |
| E-UTRA Chani (BW _{channel}) | nel Bandwidth | MHz | 10 | 10 | 10 | | |
| Correlation Ma Antenna Config | 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 | ABS | As defined in Table A.3.4.1.2-1 | |
| ABS Pattern | | | N/A | '000010000 0000010000 0' | '000010000 000010000 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 n resource restric | | | '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 | | us | 0 | 3 | 2 | | |
| Frequency offs | | Hz | 0 | 300 | -100 | | |
| Physical Cell II | ט | | PCI _{cell1} | $ \begin{aligned} &(\text{PCI}_{\text{cell1}}\text{-}\\ &\text{PCI}_{\text{cell2}})\\ &\text{mod3} = 0,\\ &\text{PCI}_{\text{cell1}} \text{ not}\\ &\text{equal to}\\ &\text{PCI}_{\text{cell2}} \end{aligned} $ | (PCI _{cell3}) 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 _Α , ρ _Β | | -3 | -3 | -3 | and Table 7.6.1-2 | |
| | Ratio of PDCCH to RS EPRE | | -3 | Non-ABS and subframe cha defined in Tal | | 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 subframe cha defined in Tal | | 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.7.3.20.1-2: 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 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 | | 00.0 700 | 000700 | | | |
| 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 | | | |
| N 4 5 4 | | | | | | |

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,

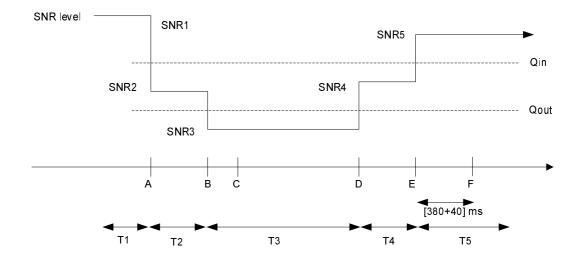


Figure A.7.3.20.1-1 SNR variation for in-sync testing

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

| Para | meter | Unit | Value | | | Comment | |
|--------------------------------------|----------------------------------|----------------------------|--|--|---|---|--|
| | | | | Test 1 | | | |
| DOELOL L'ODO | 211/2111211 | | Cell 1 | Cell 2 | Cell 3 | A | |
| PCFICH/PDC0 parameters | CH/PHICH | | R.9 FDD | R.9 FDD | R.9 FDD | As specified in section 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 | | |
| | hannel Number | | 1 | 1 | 1 | One E-UTRA FDD 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.3.4.2.2-2 | |
| ABS Pattern | | | N/A | '01000001 000000100 000000100 0000100000 0' | '010000001 0000000100 0000000100 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 r resource restri | ction pattern | | '010000001 0000000100 0000000100 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 | see PCI conditions | The CRS assistance information is provided for Cell 2 and Cell 3 in CRS- | |
| IIIOIIIIAUOII | antennaPorts below below an2 an2 | | | AssistanceInfo. It includes a single MBSFN- | | | |
| | Count mbsfn- SubframeCo | sfn- fourFrames fourFrames | | | SubframeConfig element with subframe allocation | | |
| | nfigList | | | "100001000 1000001000 01000' | 100001000 1000001000 01000' | fourFrames = '1000010000100001 000' | |
| Time offset be (With respect t | | us | 0 | 3 | 2 | | |
| | ft between cells | Hz | 0 | 300 | -100 | | |
| Physical Cell II | | | 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 | | | 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 Qin and | |
| (Note 1) | n level | | | | | the corresponding | |
| | ρ _A , ρ _B | | -3 | -3 | -3 | hypothetical | |
| | Ratio of | | -3 | Non-ABS and | IABS | PDCCH/PCFICH | |
| | PDCCH to | | | subframe cha | | transmission parameters | |
| | RS EPRE | | | | 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 | | | | | 0.0.00 10 00.2.2 | |
| parameters | symbols | | | | | | |
| (Note 1) | Aggregatio | CCE | 8 | 8 | 8 | Out of sync threshold Qout | |
| , | n level | | | | | and the corresponding hypothetical | |
| | ρΑ, ρΒ | | -3 | -3 | -3 | | |
| | Ratio of | dB | 1 | Non-ABS and | | PDCCH/PCFICH transmission parameters are as specified in section | |
| | PDCCH to | 42 | ' | subframe cha | | | |
| | RS EPRE | | | | ole A.3.4.2.2-2. | | |
| | Ratio of | dB | 1 | | 310 7 1101 11212 21 | 7.6.1 and Table 7.6.1-1 | |
| | PCFICH to | GB. | 1' | | | respectively. | |
| | RS EPRE | | | | | | |
| | INO EI INE | | | | | | |
| | | | | | T | | |
| DRX | | | OFF | OFF | OFF | | |
| Layer 3 filtering | | | Enabled | Disable | Disable | Counters: | |
| | | | 1 | | | 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 | 2 | | | Minimum CQI reporting | |
| | | s | | | | periodicity | |
| T1 | T1 | | 0.5 | N/A | | | |
| T2 | | S | 0.4 | | | | |
| T3 | | S | 1.46 | | | | |
| T4 | | S | 0.4 | | | | |
| T5 | | S | 1 | | | | |
| | | | | | | | |

Table A.7.3.21.1-2: Cell specific test parameters for E-UTRAN FDD in-sync radio link monitoring test

| Parameter | Unit | Test 1 | | | | | | |
|---------------------------|--------|--------|------|----------|-------|-------|-----------|----------------|
| | | Cell1 | | | Cell2 | Cell3 | | |
| | | T1 | T2 | 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 FDD |) | | 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 | | | | | | l able 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.

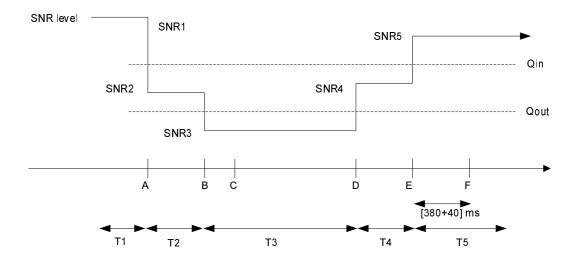


Figure A.7.3.21.1-1 SNR variation for in-sync testing

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

| Para | meter | Unit | Value | | Comment | |
|--------------------------------------|-----------------------|------|--------------------------------|---|--|--|
| | | | | Test 1 | | |
| PCFICH/PDC0 | CH/PHICH | | R.9 TDD | R.9 TDD | R.9 TDD | As specified in section A.3.1.2.2. |
| parameters | | | | | | 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. |
| Time domain r resource restri | ction 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 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- |
| monnation | antennaPorts Count | | | an2 | an2 | AssistanceInfo. It includes a single MBSFN- |
| | mbsfn- SubframeCo | | | fourFrames | fourFrames | SubframeConfig element with subframe allocation |
| | nfigList | | | '010000100 0010000100 00000' | '010000100 0010000100 00000' | fourFrames = '010000100001000010000 000' |
| Time offset fro | | us | 0 | 3 | 2 | |
| Frequency offs Physical Cell I | | Hz | O PCI _{cell1} | 300 (PCI _{cell1} - PCI _{cell2}) mod3 = 0, PCI _{cell1} not equal to | -100 (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 cha defined in Tab | | 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 | | 2 | 2 | 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 respectively. | |
| | Ratio of PDCCH to RS EPRE | dB | 1 | Non-ABS and subframe cha defined in Tab | | | |
| | 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 s | 0.4 | | | | |
| T5 | T5 | | 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 | | | | 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 | | | | | | | | |
| 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 | | | 11 | | | | ABS subframe |
| PDCCH_RA | dB | | | | | | | ers 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 | 1 | | | | | | |
| OCNG RB ^{Note 3} | dB | 1 | | | | | | |
| SNR Note 8 | 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: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.

SNR4 and SNR5 respectively in figure A.7.3.22.1-1.

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,

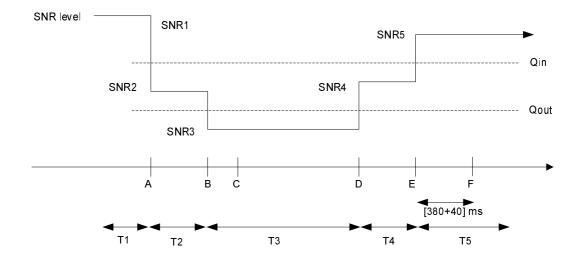


Figure A.7.3.22.1-1 SNR variation for in-sync testing

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 | Test 4 | | | | |
|--|------|-----------|------|-------|--|--|
| | | 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 | ameter | Unit | 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 Tabl 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 | T3 | 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

| Parameter | | Unit | 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 Qin 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 | | 3 | 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 | T3 | 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

| Parameter | | Unit | Value | Comment |
|---|--------------------------------------|------|---|--|
| Active cell | | | Cell 1 | Cell 1 is on E-UTRA RF channel number 1 |
| E-UTRA RF C | | 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 filtering | | | 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 | 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) | | | | | | |
| 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 | | 0 | | | |
| 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 | | -98 | | | |
| | kHz | | 1 | | | |
| SNR Note 6 | dB | -2.1 | -6.9 | -12.9 | | |
| Propagation condition | | | ETU 70Hz | | | |
| Correlation Matrix and | | | 2x1 Low | | | |
| Antenna Configuration | l | | | 11.0.4 | | |
| Note 1: OCNG shall be | | | | | | |
| are fully alloca | | | | | | |
| spectral densit | | | | | | |
| Note 2: The uplink res | | | | nea to | | |
| Note 3: The timers and | | | | re are | | |
| | | | | is ait | | |
| | 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. | | | | | |
| | · | | | | | |
| | 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.7.3.26.1-1. | | . , | Ü | | | |

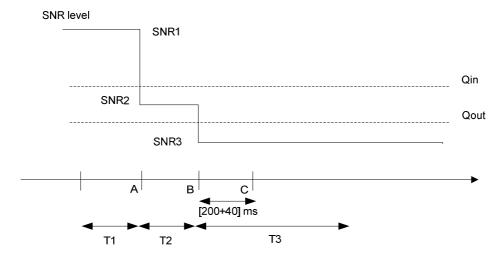


Figure A.7.3.26.1-1: SNR variation for out-of-sync testing

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

| Parameter | | Unit | Value | Comment |
|--------------------------------|--------------------------------------|------|-----------|---|
| Active cell | | | Cell 1 | Cell 1 is on E-UTRA RF |
| | Channal Number | | 1 | channel number 1 One E-UTRA FDD carrier |
| E-UTRA RF Channel Number | | | ļ | frequency is used. |
| E-UTRA Cha | nnel Bandwidth | MHz | 10 | noducitoy to docu. |
| (BW _{channel}) | | | | |
| CP length | I = 4.4 | | Normal | |
| In sync | DCI format | | 1C | As defined in clause 5.3.3.1.4 in TS 36.212 |
| transmissio n parameters | Number of Control OFDM symbols | | 2 | In sync threshold Q _{in} and the corresponding hypothetical |
| (Note 1) | Aggregation level | CCE | 4 | PDCCH/PCFICH transmission parameters |
| | ρΑ, ρΒ | | -3 | are as specified in clause |
| | Ratio of PDCCH to RS EPRE | dB | 1 | 7.11.1 and Table 7.11.1-2 respectively. |
| | Ratio of PCFICH to RS EPRE | dB | 1 | |
| Out of sync | DCI format | | 1A | As defined in clause 5.3.3.1.3 in TS 36.212 |
| transmissio n parameters | Number of Control OFDM symbols | | 2 | Out of sync threshold Q _{out} and the corresponding hypothetical |
| (Note 1) | Aggregation level | CCE | 8 | PDCCH/PCFICH transmission parameters |
| | ρ _A , ρ _B | | -3 | 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 | | | 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 | 2 | Minimum CQI reporting periodicity |
| T1 | | S | 0.5 | |
| T2 | | S | 0.4 | |
| T3 | | S | 1.46 | |
| T4 | | S | 0.4 | |
| T5 | OCCU/DOFICIL com | 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 | | | | T5 | | |
| 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 FDI |) | | | |
| A.3.2.1 (FDD) | | | | | | | | |
| ρΑ, ρΒ | | | | -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 kHz | | | -98 | | | | |
| SNR Note 6 | dB | -2.1 | -6.9 | -12.9 | -7.1 | -2.1 | | |
| Propagation condition | | ETU 70Hz | | | | | | |
| 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.

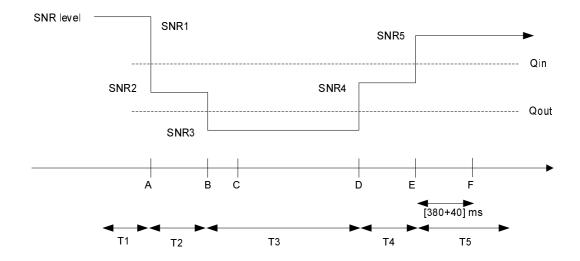


Figure A.7.3.27.1-1: SNR variation for in-sync testing

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 | hannel 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 | | 1000 | T311 is enabled |
| Periodic CQI reporting mode | | | PUCCH 1- | As defined in table 7.2.2- |
| | | | 0 | 1 in TS 36.213. |
| CQI reporting periodicity | | ms | 2 | Minimum CQI reporting |
| T4 | | | 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 | |
| SNR Note 6 | kHz | 0.4 | 40.0 | 440 |
| | dB | -6.1 | -10.0 AWGN | -14.0 |
| Propagation condition | | | | |
| Correlation Matrix and | | | 2x1 | |
| Antenna Configuration | | | | 11 11 4 |
| Note 1: OCNG shall be | | | | |
| are fully allocate | | | | |
| spectral density Note 2: The uplink resou | | | | |
| the UE prior to the | | | , , | neu to |
| Note 3: The timers and I | | | | re ara |
| configured prior | | | | is alt |
| Note 4: The signal conta | | | | he |
| device under tes | | | | - |
| Note 5: SNR levels corre | | | noise rati | o over |
| the cell-specific | | | | - |
| Note 6: The SNR in time p | periods T1, | T2 and T3 | is denoted | |
| SNR1, SNR2 and SNR3 re | spectively | 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 |
| TimeAlignmentTimer | IIIIIIIIIIIIII | 36.331 |
| | | For further information see |
| sr-ConfigIndex | 0 | clause 6.3.2 in TS 36.331 and |
| | | section10.1 in TS 36.213. |

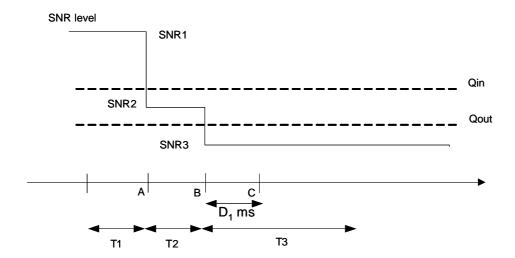


Figure A.7.3.28.1-1: SNR variation for out-of-sync testing in DRX

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

| Parameter | | Unit | Value | Comment |
|------------------------------------|---------------------------------|---------|-----------|--|
| Active cell | | | Cell 1 | Cell 1 is on E-UTRA RF |
| E LITOA DE C | hannal Niveshau | | 1 | channel number 1 One E-UTRA FDD carrier |
| E-UTRA RE C | hannel 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 | |
| CF letigiti | 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/PCFICH |
| (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 Q _{out} |
| 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 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 | |
| | CCH/DCEICH correspon | | | |

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 | | | 11 | | |
| 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 | | | | | |
| N_{oc} | dBm/15 | | | -98 | | |
| | kHz | | T | 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 | | | | | and a con | stant total |
| transmitted power sp | | | | | | |
| Note 2: The uplink resources | | | | | | |
| Note 3: The timers and layer | : 3 filtering rela | ated paramete | ers are config | ured 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. |

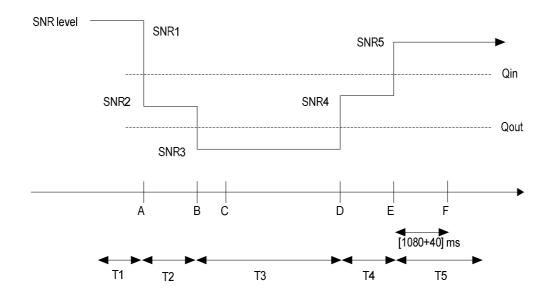


Figure 7.3.29.1-1: SNR variation for in-sync testing in DRX

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 | Parameter | | 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. |
| | nel Bandwidth | MHz | 10 | |
| (BW _{channel}) | | | | |
| CP length | | | Normal | |
| | DCI format | | 1A | As defined in section |
| 0 | | | | 5.3.3.1.3 in TS |
| Out of sync | November of | | 0 | 36.212 |
| transmission parameters | Number of Control OFDM | | 2 | Out of sync threshold |
| (Note 1) | | | | Q _{out} and the corresponding |
| (Note 1) | symbols Aggregation level | CCE | 8 | hypothetical |
| | | CCL | -3 | PDCCH/PCFICH |
| | ρ _A , ρ _B Ratio of PDCCH | dB | 4 | transmission |
| | to RS EPRE | uБ | 4 | parameters are as |
| | Ratio of PCFICH | dB | 1 | specified in section |
| | to RS EPRE | GD. | ' | 7.11.1 and Table |
| | to NO EL NE | | | 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 | [TBD] | Minimum CQI |
| | | - | | reporting periodicity |
| T1 | | S | 1 | |
| T2 | | S | 0.4 | |
| T3 | 0011/0051011 | S | 0.5 | |
| Note 1: PD | CCH/PCFICH corres | ponding | to the out of syr | nc transmission |

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 | Т3 | |
| E-UTRA RF Channel | | | 1 | | |
| Number | | | | | |
| BW _{channel} | MHz | | 10 | | |
| PCFICH/PDCCH/PHIC | | F | R.4 HD-FDI |) | |
| 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 | | | | | |
| Note 1: OCNG shall be | e used such | that the res | sources in o | cell # 1 | |
| are fully alloca | ited and a co | nstant tota | l transmitte | d power | |
| spectral densi | ty is achieved | d for all OF | DM symbo | ls. | |
| Note 2: The uplink res | ources for Co | QI reporting | g are assig | ned to | |
| the UE prior to | | | | | |
| Note 3: The timers and | | | | rs are | |
| configured price | | | | | |
| Note 4: The signal cor | | | other than t | he | |
| device under t | | | | | |
| Note 5: SNR levels co | | | | o over | |
| the cell-specifi | | | | | |
| Note 6: The SNR in tir | | | | | |

SNR1, SNR2 and SNR3 respectively in figure A.7.3.30.1-

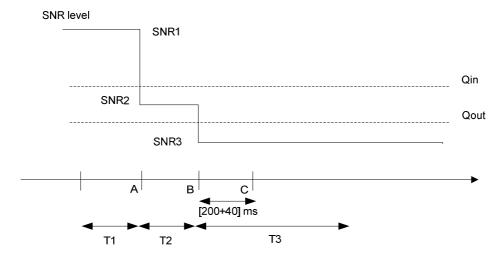


Figure A.7.3.30.1-1: SNR variation for out-of-sync testing

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

| Pa | arameter | Unit | Value | Comment |
|---------------------------|---|--------|-----------|--|
| 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. |
| (BW _{channel}) | E-UTRA Channel Bandwidth (BW _{channel}) | | 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, ρв | | -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 | 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 T5 | | S S | 0.4 | |

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 | 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 | 1 | |
| ρ_{A},ρ_{B} | | | | -3 | | |
| PCFICH_RB | dB | 1 | | | <u> </u> | |
| 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.

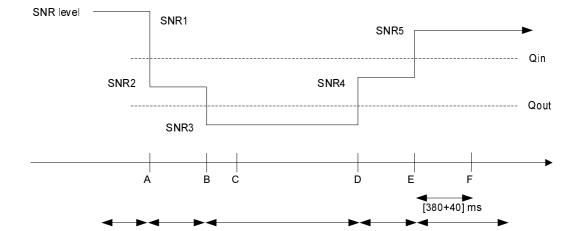


Figure A.7.3.31.1-1: SNR variation for in-sync testing

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

| P | arameter | Unit | Value | Comment |
|---------------------------|-------------------------------|----------|--------------------|--|
| Active cell | | | Cell 1 | Cell 1 is on E-UTRA RF |
| | | | | channel number 1 |
| E-UTRA RF C | Channel Number | | 1 | One E-UTRA FDD carrier |
| | | | | frequency is used. |
| E-UTRA Char | nnel Bandwidth | MHz | 10 | |
| (BWchannel) | | | | |
| CP length | | | Normal | |
| | 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 | 005 | | and the corresponding |
| parameters | Aggregation level | CCE | 8 | hypothetical PDCCH/PCFICH |
| (Note 1) | ρΑ, ρΒ | | -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 | | 1 | respectively. |
| DRX cycle | I NO LI INL | ms | 1280 | See Table A.7.3.32.1-3 |
| Layer 3 filterin | na | | Enabled | Counters: |
| | 9 | | | 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 | 5 | Minimum CQI reporting periodicity |
| T1 | | S | 32 | |
| T2 | | S | 12.8 | |
| T3 | | S | 13 | |
| Note 1: PD | CCH/PCFICH correspo | nding to | the out of sync to | ransmission parameters need |

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 | D | | |
| parameters specified in | | | | | | |
| clause A.3.1.2.3 | | | | | | |
| OCNG Pattern defined in | | | OP.2 FDD | | | |
| A.3.2.1 (FDD) | | | | | | |
| ρα, ρΒ | -ID | | -3 | | | |
| PCFICH_RB | dB | | 11 | | | |
| PDCCH_RA | dB dB | | <u>4</u> 4 | | | |
| PDCCH_RB PBCH_RA | dB dB | | 4 | | | |
| PBCH_RA | dB 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 | -5.4 | -9.5 | -13.5 | | |
| Propagation condition | | | AWGN | | | |
| Correlation Matrix and | | | 2x1 | | | |
| Antenna Configuration | | | | 11.11.4 | | |
| Note 1: OCNG shall be | | | | | | |
| are fully allocate spectral density | | | | | | |
| Note 2: The uplink resou | | | | | | |
| the UE prior to t | | | | neu to | | |
| Note 3: The timers and | | | | rs are | | |
| configured prior | | | | | | |
| Note 4: The signal conta | · | | | | | |
| device under tes | st as part of | OCNG. | | | | |
| | 5: SNR levels correspond to the signal to noise ratio over | | | | | |
| the cell-specific | | | | | | |
| Note 6: The SNR in time | | | | | | |
| SNR1, SNR2 ar | na SNR3 re | spectively | 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 |
|--------------------|----------------|------------------------------------|
| TimeAlignmentTimer | infinity | As specified in clause 6.3.2 in TS |
| TimeAlignmentTimer | IIIIIIIIIIIIII | 36.331 |
| | | For further information see |
| sr-ConfigIndex | 0 | clause 6.3.2 in TS 36.331 and |
| | | section10.1 in TS 36.213. |

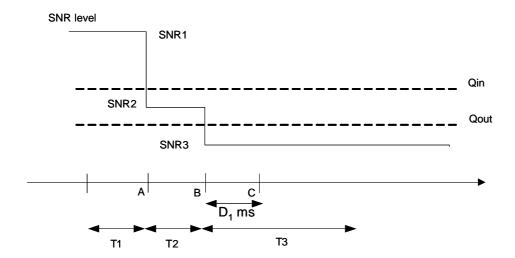


Figure A.7.3.32.1-1: SNR variation for out-of-sync testing in DRX

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

| Pa | rameter | Unit | Value | Comment | | |
|-----------------------------|---|----------------|-----------------|---|--|--|
| Active cell | | | Cell 1 | Cell 1 is on E-UTRA RF | | |
| E-UTRA RF C | hannel Number | | 1 | channel number 1 One E-UTRA FDD carrier frequency is used. | | |
| | E-UTRA Channel Bandwidth (BW _{channel}) | | 10 | noquonoy io uoou. | | |
| CP length | | | Normal | | | |
| J | 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 | | |
| | ρα, ρв | | -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 | | |
| | ρα, ρв | | -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 | | ms | 5 | Minimum CQI reporting periodicity | | |
| T1 | | S | 4 | | | |
| T2 | | S | 1.6 | | | |
| T3 | | S | 1.46 | | | |
| T4 | | S | 0.4 | | | |
| Note 1: PDC | CU/DCEICH corross | S anding to | the in supe 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

| Parameter | 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 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 | _ | | 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 dB | -5.4 | -9.5 | -13.5 | -9.4 | -5.4 |
| | UD | -0.4 | -9.0 | AWGN | -9.4 | -0.4 |
| Propagation condition | | | | | | |
| Correlation Matrix and | | | | 2x1 | | |
| Antenna Configuration | 1 1 1 1 1 1 | | | (II) II : | | |
| Note 1: OCNG shall be used | | | | | d and a cor | istant total |
| transmitted power sp | | | | | | ma nariad T1 |
| Note 2: The uplink resources | | | | | | |
| Note 3: The timers and layer | | | | | | |

- 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.7.3.33.1-1.

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. |

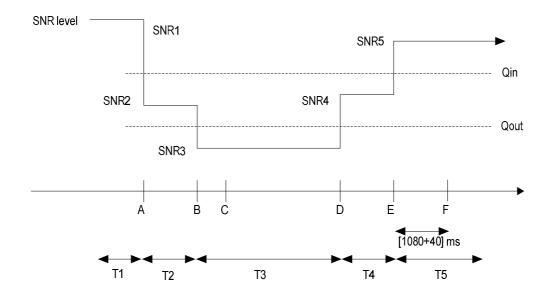


Figure A.7.3.33.1-1: SNR variation for in-sync testing in DRX

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 | | | 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 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 | | |
| Note 1: DDCCH/DCFICH corresponding to the cut of avec transmission | | | | | |

1.

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

| Pa | rameter | Unit | | Test 1 | | |
|---------------------------------|--|---------------|--------------|--------------|----------|--|
| | ramoto: | O.I.I. | T1 | T2 | T3 | |
| E-UTRA | RF Channel | | | 1 | | |
| Number | | | | | | |
| BW _{channel} | | MHz | | 10 | | |
| Special s | ubframe | | | 6 | | |
| configura | tion Note 1 | | | | | |
| Uplink-do | wnlink | | | 1 | | |
| configura | tion Note 1 | | | | | |
| | PDCCH/PHIC | | | R.7 TDD | | |
| | eters defined | | | | | |
| | A.3.1.2.2 | | | | | |
| | attern defined | | | | | |
| in A.3.2.2 | 2 (100) | | | OP.2 TDD | | |
| ρ _Α , ρ _Β | DD | ID | | -3 | | |
| PCFICH_ | | dB | | 11 | | |
| PDCCH_ | | dB | | 4 | | |
| PDCCH_ | | dB | | 4 | | |
| PBCH_R | | dB | | | | |
| PBCH_R PSS_RA | | dB | | | | |
| | | dB | -3 | | | |
| SSS_RA | | dB | | | | |
| PHICH_F | | dB dB | | J | | |
| | | | | | | |
| PDSCH_ PDSCH_ | | dB dB | | | | |
| OCNG_R | Note 2 | dB | | | | |
| OCNG_R | RNote 2 | dB | | | | |
| | | dBm/15 | | -98 | | |
| N_{oc} | | kHz | | -30 | | |
| SNR Note | 1 | dB | -1.6 | -5.9 | -11.9 | |
| | ion condition | | | ETU 70Hz | | |
| | on Matrix and | | | 2x1 Low | | |
| | Configuration | | | ZX. ZOW | | |
| Note 1: | For special sul | oframe and u | ıplink-dowr | nlink config | urations | |
| | see Tables 4.2 | | | | | |
| Note 2: | OCNG shall be | e used such | that the res | sources in c | ell # 1 | |
| | are fully alloca | ted and a co | nstant tota | I transmitte | d power | |
| | spectral densit | y is achieved | d for all OF | DM symbol | ls. | |
| Note 3: | The uplink res | | | | ned to | |
| | the UE prior to | | | | | |
| Note 4: | The timers and layer 3 filtering related parameters are | | | | | |
| N | configured prior to the start of time period T1. | | | | | |
| Note 5: | Note 5: The signal contains PDCCH for UEs other than the | | | | | |
| Note C | device under test as part of OCNG. SNR levels correspond to the signal to noise ratio over | | | | | |
| Note 6: | | | | | over | |
| Note 7: | the cell-specifi The SNR in tin | | | | ad as | |
| INOLE 1. | | | | | | |
| | SNR1, SNR2 and SNR3 respectively in figure A.7.3.34.1- | | | | | |

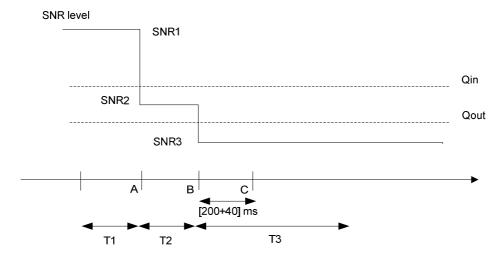


Figure A.7.3.34.1-1: SNR variation for out-of-sync testing

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 | rameter | Unit | Value | Comment | |
|--|--------------------------------|------|-----------|--|--|
| | | | Test 1 | | |
| 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 Chanr (BW _{channel}) | nel Bandwidth | 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 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 | | |
| T2 | | S | 0.4 | | |
| Т3 | | S | 1.46 | | |
| T4 | | S | 0.4 | | |
| T5 | | S | 1 | | |

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 | 1 | | | | |
| 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 | | | | |
| 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
- 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.

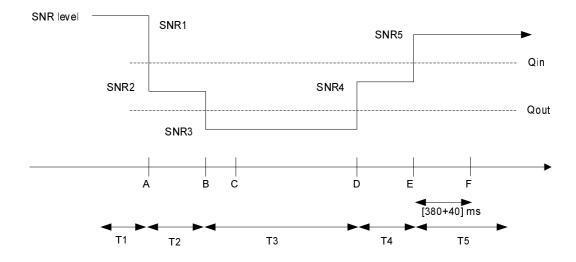


Figure A.7.3.35.1-1: SNR variation for in-sync testing

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 | | ıs | 0 | T310 is disabled |
| T311 timer | | ıs | 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 | | ıs | 1 | Minimum CQI |
| | | | | reporting periodicity |
| T1 | S | _ | 32 | |
| T2 | S | 6 | 12.8 13 | |
| T3 | | | | |

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

| Pa | arameter | Unit | Test 2 | | | | | |
|---------------------------------|---|--|-------------|--------------|-----------|--|--|--|
| | | | T1 | T2 | T3 | | | |
| E-UTRA | RF Channel | | | 1 | ' | | | |
| Number | | | | | | | | |
| BW _{channel} | | MHz | | 10 | | | | |
| Special s | ubframe | | | 6 | | | | |
| configura | ition Note 1 | | | | | | | |
| I Uplink-do | ownlink | | 1 | | | | | |
| configura | tion Note 1 | | | | | | | |
| PCFICH/ | PDCCH/PHICH | | | R.7 TDD | | | | |
| | ers defined in | | | | | | | |
| section A | | | | | | | | |
| | attern defined in | | | OP.2 TDD |) | | | |
| A.3.2.2 (| TDD) | | | | | | | |
| ρ _Α , ρ _Β | | | | -3 | | | | |
| PCFICH_ | | dB | | 1 | | | | |
| PDCCH_ | | dB | | 4 | | | | |
| PDCCH_ | | dB | | 4 | | | | |
| PBCH_R | | dB | | | | | | |
| PBCH_R | | dB | | | | | | |
| PSS_RA | | dB | | | | | | |
| SSS_RA | | dB | | 0 | | | | |
| PHICH_F | | dB | | -3 | | | | |
| PHICH_F | | dB | | | | | | |
| PDSCH_ | | dB | | | | | | |
| PDSCH_ | RB | dB | | | | | | |
| OCNG_R | RA Note2 | dB | | | | | | |
| OCNG_R | RBNotes | dB | | | | | | |
| N_{oc} | | dBm/15 | | -98 | | | | |
| SNR Note | 7 | kHz dB | F. C | 0.6 | 12.6 | | | |
| | ion condition | uБ | -5.6 | -9.6 AWGN | -13.6 | | | |
| | | | | | | | | |
| | on Matrix and | | | 2x1 | | | | |
| | Configuration | romo ond i | inlink down | aliak aanfia | urationa | | | |
| Note 1: | For special subfi see Tables 4.2-1 | | | | urations | | | |
| Note 2: | | | | | cell # 1 | | | |
| NOIG Z. | | 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: | | | | | | | | |
| 1.0.0 0. | 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 corre | | | o noise rati | o over | | | |
| | the cell-specific | reference s | signal REs | ı | | | | |
| Note 7: | The SNR in time | | | | | | | |
| | SNR1, SNR2 an | d 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 |
|--------------------|----------|------------------------------------|
| TimeAlianmentTimer | infinity | As specified in clause 6.3.2 in TS |
| TimeAlignmentTimer | ппппц | 36.331 |
| | | For further information see |
| sr-ConfigIndex | 2 | clause 6.3.2 in TS 36.331 and |
| | | section10.1 in TS 36.213. |

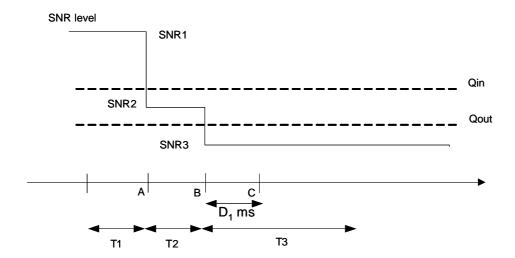


Figure A.7.3.36.1-1: SNR variation for out-of-sync testing in DRX

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 | rameter | Unit | Value | Comment |
|---------------------------|---------------------------------|----------|-----------------|--|
| Active cell | Active cell | | Cell 1 | Cell 1 is on E-UTRA RF channel |
| | | | | number 1 |
| E-UTRA RF Ch | RA RF Channel Number | | 1 | One E-UTRA TDD carrier |
| | | | | frequency is used. |
| E-UTRA Chann | nel Bandwidth | MHz | 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 | | | 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 |

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 | | | | | | |
| 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_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 | -3 | | | | | | |
| SSS_RA | dB | | | | | | | |
| PHICH_RA | dB | | | | | | | |
| 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 sp | I such that the | resources in | cell # 1 are f | fully allocated | | | | |

- 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 3:
- 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 | 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. |

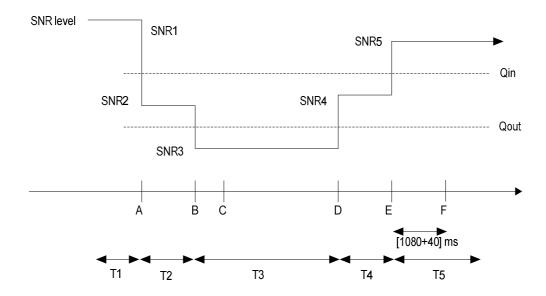


Figure A.7.3.37.1-1: SNR variation for in-sync testing in DRX

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

| Active cell | | | 0 11 4 | |
|-----------------------------------|--------------------------------|-----|-----------|--|
| OD In white | | | Cell 1 | Cell 1 is PCell on E-UTRA RF channel number 1, and |
| OD 1 | | | Cell 2 | cell 2 is PSCell on E-UTRA RF channel number 2 |
| CP length | | | Normal | |
| E-UTRA RF Cha | annel Number | | 1, 2 | Two E-UTRA FDD carrier frequencies are used. |
| E-UTRA Channe (BWchannel) | el Bandwidth | MHz | 5, 10, 20 | |
| Correlation Matr 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 |
| | Number of Control OFDM symbols | | 2 | Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters |
| Out of sync transmission | Aggregation level | CCE | 8 | are as specified in clause 7.6.1 and Table 7.6.1-1 |
| parameters | ρΑ, ρΒ | | -3 | respectively. |
| (Note 1) | Ratio of PDCCH to RS EPRE | dB | 1 | |
| _ · | Ratio of PCFICH to RS EPRE | | 1 | |
| DRX cycle on ce | ell 1 | ms | 640 | See Table A.7.3.38.1-3 |
| DRX cycle on ce | ell 2 | ms | 40 | See Table A.7.3.38.1-3 |
| Timing offset be cell 2 | tween cell 1 and | μS | 33 | For synchronous dual connectivity |
| 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 | | ms | 0 | T313 is disabled |
| Periodic CQI rep | porting 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 | |

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 | 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 | |
| PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test | | 5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD | | | 10 20 | MHz: R.12 F MHz: R.7 F MHz: R.13 F | DD DD |
| OCNG Pattern | | 101 | IHz: OP.16 F MHz: OP.2 F MHz: OP.12 I | DD | 101 | lHz: OP.16 f MHz: OP.2 f ИHz: OP.12 | -DD |
| 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 | | | | | | |
| 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 | | | | -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 |
|--------------------------|---------|---------|---|
| 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 | |

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. |

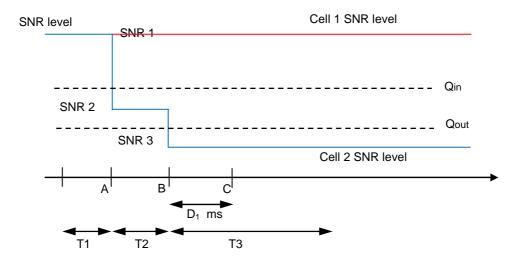


Figure A.7.3.38.1-1 SNR variation for out-of-sync testing in DRX

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

| 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 | |
| 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 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 cell 1 | | ms | 640 | See Table A.7.3.39.1-3 |
| DRX cycle in cell 2 | | 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 | | ms | 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 | 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

| Parameter | | Unit | Cell 1 (PCell) | | Cell 2 (PSCell) | | | | |
|-------------------------------------|--------------------------|----------|-----------------------|----------------|-----------------|------------------|----------------|-------|--|
| | | | T1 | T2 | T3 | T1 | T2 | T3 | |
| E-UTRA RF Channel | | | | 1 | | | 2 | | |
| Number | | MHz | | | | | | | |
| | E-UTRA Channel | | | 5, 10, 20 | | | 5, 10, 20 | | |
| Bandwidth | | | | | | | | | |
| PCFICH/PI | | | | 5MHz: R.12 FDD | | | 5MHz: R.12 FDD | | |
| CH parame None of the | | | - | 10MHz: R.7 FDD | | | 10MHz: R.7 FDD | | |
| are intende | | | 20MHz: R.13 FDD | | | 20MHz: R.13 FDD | | | |
| UE under t | | | | | | | | | |
| Correlation | | | 2x2 Low | | | 2x2 Low | | | |
| and Antenr | | | ZXZ LOW | | ZXZ LOW | | | | |
| Configurati | | | | | | | | | |
| OCNG Pat | | | 5MHz: OP.16 FDD | | | | | | |
| defined in A | | | 10MHz: OP.2 FDD | | | 5MHz: OP.16 FDD | | | |
| (FDD) | | | 20MHz: OP.12 FDD | | 10MHz: OP.2 FDD | | | | |
| | | | 201711 21 01 112 1 22 | | | 20MHz: OP.12 FDD | | | |
| ρ _A , ρ _B | | | -3 | | | -3 | | | |
| PCFICH_RB | | dB | 1 | | | 1 | | | |
| PDCCH_RA | | dB | 1 | | | 1 | | | |
| PDCCH_R | | dB | 1 | | | 1 | | | |
| PBCH_RA | | dB | | | | | | | |
| PBCH_RB | | dB | -3 -3 | | | | | | |
| PSS_RA | | dB | | | | | | | |
| SSS_RA | | dB | | | | | | | |
| PHICH_RA | | dB | | | | | | | |
| PHICH_RB | | dB | | | | | | | |
| PDSCH_R | | dB | | | | | | | |
| PDSCH_R | B Note1 | dB dB | | | | | | | |
| OCNG_RA | OCNG_RA ^{Note1} | | | | | | | | |
| OCNG_RB ^{Note1} | | dB | | | | | | 100 | |
| SNR Note 6 | 5MHz | dB | -2.3 | -2.3 | -2.3 | -2.3 | -5.7 | -12.2 | |
| | BW _{channel} | 4D | 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 | -2.9 | -2.9 | -2.9 | -2.9 | -6.8 | -12.8 | |
| | BW _{channel} | uВ | -2.9 | -2.9 | -2.9 | -2.9 | -0.8 | -1∠.8 | |
| N_{oc} | | dBm/15 | -98 | | | -98 | | | |
| | | kHz | | | | | | | |
| Propagation condition | | | ETU 70 Hz | | | ETU 70 Hz | | | |
| Receive time offset to cell1 Note 7 | | 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. |

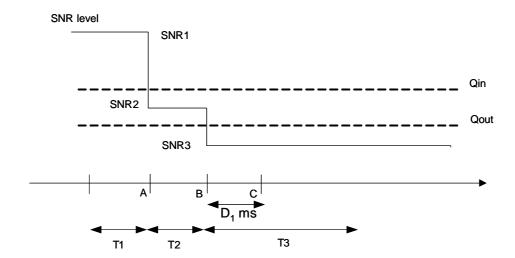


Figure A.7.3.39.1-1 SNR variation for out-of-sync test in DRX

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 test 1 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 test 1 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 test 1 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

| 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 | CP length | | Normal | |
| E-UTRA RF C | Channel Number | | 1, 2 | Two E-UTRA TDD carrier frequencies are used. |
| E-UTRA Char (BWchannel) | nnel Bandwidth | MHz | 5, 10, 20 | |
| Correlation Ma Configuration | atrix 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 clause 5.3.3.1.3 in TS 36.212 |
| Out of sums | Number of Control OFDM symbols | | 2 | Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters |
| Out of sync transmission | Aggregation level | CCE | 8 | are as specified in clause 7.6.1 and Table 7.6.1-1 |
| parameters | ρΑ, ρΒ | | -3 | respectively. |
| (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 local 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 | | ms | 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 | 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 | | |
| 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 | | 5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD | | | 5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD | | | |
| 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 | | 0 | | 2 | | | |
| 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 | -98 | | | -98 | | | |
| Propagation condition | | ETU 70 Hz | | | ETU 70 Hz | | | |
| Time offset to cell1 | μS | | - - TO 0 | | | 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. |

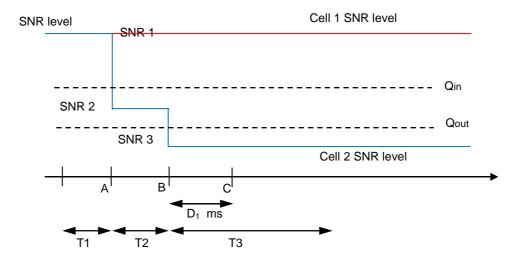


Figure A.7.3.40.1-1 SNR variation for out-of-sync testing in DRX

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

| | 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 |
| | 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/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

| Doza | ameter | Unit | Cell 1(PCell) | | Cell 2 (PSCell) | | | | |
|---|----------------------------|----------------|-----------------------------|---------------------------|-----------------|---------------------------|------|------|--|
| | | Unit | T1 ~ T5 | T1 | T2 | T3 | T4 | T5 | |
| E-UTRA RF Ch | annel Number | | 1 | | | 2 | | | |
| BW _{channel} | | MHz | 5: $N_{RB,c} = 25$ | 5: N _{RB,c} = 25 | | | | | |
| | | | 10: $N_{RB,c} = 50$ | | |): N _{RB,c} = | | | |
| | | | 20: N _{RB,c} = 100 | | | $: N_{RB,c} = 1$ | | | |
| PCFICH/PDCCI | | | 5MHz: R.11 FDD | | | Hz: R.11 F | | | |
| parameters defi | ned in A.3.1.2.1 | | 10MHz: R.6 FDD | | | /Hz: R.6 F | | | |
| 00110 5 # | I (' I A O O A | | 20MHz: R.10 FDD | | | Hz: R.10 | | | |
| | defined in A.3.2.1 | | 5MHz: OP.16 FDD | | | Iz: OP.16 | | | |
| (FDD) | | | 10MHz: OP.2 FDD | | | Hz: OP.2 | | | |
| | | | 20MHz: OP.12 FDD 0 | | ZUIVII | 1z: OP.12 0 | עטד | | |
| ρ _Α , ρ _Β PCFICH_RB | | dB | 4 | | | 4 | | | |
| PDCCH_RA | | dB | 0 | | | 0 | | | |
| PDCCH_RB | | dB | 0 | | | 0 | | | |
| PBCH_RA | | dB | 0 | | | <u> </u> | | | |
| PBCH_RB | | dB | | | | | | | |
| PSS_RA | | dB | 1 | | | | | | |
| SSS_RA | | dB | 1 | | | | | | |
| PHICH_RA | | dB | | | | | | | |
| PHICH_RB | | | 0 | 0 0 | | | | | |
| PDSCH_RA | | | | | | | | | |
| PDSCH_RB | | dB | = | | | | | | |
| OCNG_RA ^{Note1} | | dB | | | | | | | |
| OCNG_RB ^{Note1} | | dB | | | | | | | |
| | 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 | 1 | -4.7 | -4.7 | -9.5 | -13.5 | -8.7 | -4.7 | |
| | BW _{channel} | | | | | | | | |
| N_{oc} | | dBm/15 kHz | -98 | | | | | | |
| Propagation cor | | | AWGN | | | AWGN | | | |
| Correlation Mate Configuration | rix and Antenna | | 1x2 | 1x2 | | | | | |
| Receive time of | fset to cell1 Note 7 | 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. 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. | | | | | | | | | |
| | | | noise ratio over the cell- | | | | s. | | |
| Note 6: The S | | periods T1, T2 | 2, T3, T4 and T5 is deno | | | | | 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. |

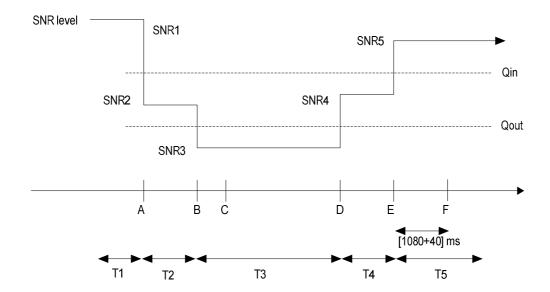


Figure A.7.3.41.1-1 SNR variation of cell 2 (PSCell) for in-sync testing in DRX

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 Con | Antenna Configuration | | 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 filterin | 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 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 | <u> </u> | S | 4 | |
| | OOLI/DOEIOLI | | | |

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

| | Parameter | | Cell 1 (PCell) | Cell 2 (PSCell) | | | | | |
|--------------------------|---|------------------|---------------------|-----------------|----------|-------------|------|------|--|
| | | Unit | T1 ~ T5 | T1 | T2 | T3 | T4 | T5 | |
| E-UTRA RF | Channel Number | | 1 | | | 2 | | | |
| E-UTRA Cha | annel Bandwidth | MHz | 5, 10, 20 5, 10, 20 | | | | | | |
| (BW _{channel}) | | | | | | | | | |
| PCFICH/PD | PCFICH/PDCCH/PHICH | | 5MHz: R.11 | | 5N | IHz: R.11 F | -DD | | |
| parameters. | | | FDD | | | MHz: R.6 F | | | |
| None of the | PDCCH are intended | | 10MHz: R.6 | | 201 | //Hz: R.10 | FDD | | |
| for the UE u | nder test. | | FDD | | | | | | |
| | | | 20MHz: R.10 | | | | | | |
| | | | FDD | | | | | | |
| OCNG Patte | ern | | 5MHz: OP.16 | | | | | | |
| | | | FDD | | 5M | Hz: OP.16 | FDD | | |
| | | | 10MHz: OP.2 | | _ | //Hz: OP.2 | | | |
| | | | FDD | | _ | Hz: OP.12 | | | |
| | | | 20MHz: OP.12 | | 2011 | 112. 01 .12 | וטט | | |
| | | | FDD | | | | | | |
| ρ_A , ρ_B | | dB | 0 | | 0 | | | | |
| | PCFICH_RB | | 4 | | 4 | | | | |
| PDCCH_RA | | dB dB | 0 | 0 | | | | | |
| | PDCCH_RB | | 0 | 0 | | | | | |
| PBCH_RA | | dB | | | | | | | |
| PBCH_RB | | dB | | | | | | | |
| PSS_RA | | dB | | | | | | | |
| SSS_RA | | dB | | | | | | | |
| PHICH_RA | | dB | 0 | 0 | | | | | |
| PHICH_RB | | dB | | · | | | | | |
| PDSCH_RA | | dB | | | | | | | |
| PDSCH_RB | 010.1 | dB | | | | | | | |
| OCNG_RAN | ote i | dB | | | | | | | |
| OCNG_RBN | | dB | | | 1 | 1 | 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 | | <u>I</u> | -98 | | | | |
| | | | | | | | | | |
| | Propagation condition | | | | AWGN | | | | |
| Receive time | e offset to cell1 Note 7 | μs | - | | <u> </u> | 500 | | | |
| tra | CNG shall be used suc ansmitted power spectra | al density is ac | chieved for all OFD | M symbol | s. | | | otal | |
| Note 2: T | Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. | | | | | | | | |

Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.

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 | |

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.7.3.42.1-4: 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. |

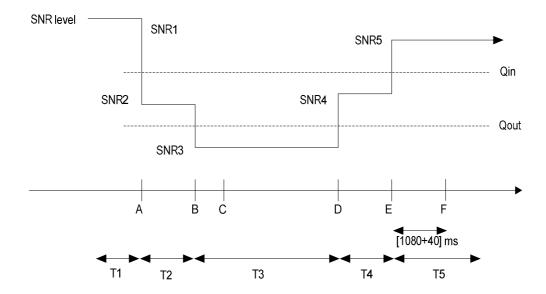


Figure A.7.3.42.1-1 Cell 2 SNR variation for in-sync testing in DRX

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 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.7.3.43.1-1: General test parameters for E-UTRAN TDD-TDD Radio Link Monitoring Test for Insync in DRX in synchronous dual connectivity

| Parameter | | Unit | Value | Comment |
|--------------------------|-----------------------------------|------|----------------|---|
| E-UTRA RF C | E-UTRA RF Channel 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 | 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.

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) | Cell 2 (PSCell) | | | | |
|--|----------------------------|---------------|-----------------------------|-----------------|---------------------------|-------------------------|------|------|
| Pa | rameter | Unit | T1 ~ T5 | T1 | T2 | T3 | T4 | T5 |
| E-UTRA RF Channel 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 condition | | | AWGN | | | AWGN | | |
| Correlation Matrix and Antenna | | | 1x2 | | | 1x2 | | |
| Configuration | Configuration | | | | | | | |
| Receive time of | offset to cell1 Note 9 | μS | - | | | 33 | | |
| No. 4. E. d. S. C. | | | | | | | | |

- 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. |

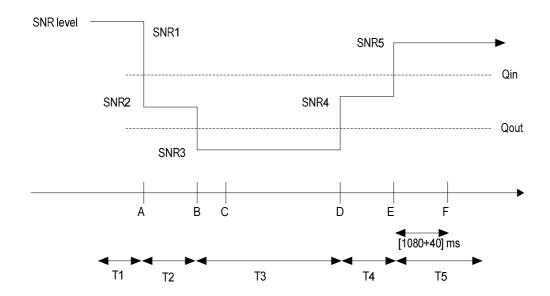


Figure A.7.3.43.1-1 SNR variation of cell 2 (PSCell) for in-sync testing in DRX

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 | | | |
| parameters: | | 5MHz: R.11 FDD | 5MHz: R.11 FDD |
| DL Reference | | 10MHz: R.6 FDD | 10MHz: R.6 FDD |
| Measurement Channel | | 20MHz: R.10 FDD | 20MHz: R.10 FDD |
| OCNG Patterns | | 5MHz: OP.16 FDD | 5MHz: OP.15 FDD |
| | | 10MHz: OP.2 FDD | 10MHz: OP.1 FDD |
| | | 20MHz: OP.12 FDD | 20MHz: OP.11 FDD |
| PBCH_RA | dB | | |
| PBCH_RB | dB | | |
| PSS_RA | dB | | |
| SSS_RA | dB | | |
| PCFICH_RB | dB dB | | |
| PHICH_RA PHICH_PB | dB dB | 0 | 0 |
| PDCCH_RA | dB | U | O |
| PDCCH_RA | dB | | |
| PDSCH_RA | dB | | |
| PDSCH_RB | dB | | |
| OCNG_RA ^{Note 1} | dB | | |
| OCNG_RB ^{Note 1} | dB | | |
| N_{oc} Note 2 | dBm/15 | 404 | 404 |
| ¹ V _{oc} | KHz | -101 | -101 |
| \hat{E}_s/N_{oc} | dB | 19 | 19 |
| \hat{E}_{s}/I_{ot} | dB | 19 | 19 |
| RSRP Note 3 | dBm/15 | -82 | -82 |
| SCH_RP Note 3 | KHz 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 4 | μs | - | 33 |
| 11 1 1 0010 1 111 | | | |

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 scheduled | 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 | | 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.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 | | | |
| | | | | | | |
| 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 | | | | | |
| $N_{oc}^{ m Note 2}$ | dBm/15 | 404 | 404 | | | |
| 1 voc | KHz | -101 | -101 | | | |
| \hat{E}_s/N_{oc} | dB | 19 | 19 | | | |
| | | 19 | 13 | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 19 | 19 | | | |
| RSRP Note 2 | dBm/15 | | | | | |
| RSRP | KHz | -82 | -82 | | | |
| SCH_RP Note 2 | dBm/15 | | | | | |
| SCI_KF | 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 | | AVVOIN | | | | |
| Antenna Configuration | | 1x2 Low | 1x2 Low | | | |
| Time offset to cell1 Note 3 | 110 | - | 33 | | | |
| Time offset to cell 1 Note 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: 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 |
|---------------------------------------|-------------|---------|------------------------------------|
| Field | 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 | | | | | |

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 | rameter 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 | |
| | | 20MHz: R.6 FDD | |
| PCFICH/PDCCH/PHIC | | 5MHz: R.11 FDD | 5MHz: R.11 FDD |
| H parameters | | 10MHz: R.6 FDD | 10MHz: R.6 FDD |
| | | 20MHz: R.10 FDD | 20MHz: R.10 FDD |
| OCNG Patterns | | 5MHz: OP.20 FDD | 5MHz: OP.16 FDD |
| defined in A.3.2.1.1 | | 10MHz: OP.10 FDD | 10MHz: OP.2 FDD |
| (OP.1 FDD) | | 20MHz: OP.17 FDD | 20MHz: OP.12 FDD |
| PBCH_RA | dB | | |
| PBCH_RB | dB | | |
| PSS_RA | dB | | |
| SSS_RA | dB | | |
| PCFICH_RB | dB | 0 | 0 |
| 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 cla | use 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 |
|--------------------|--------|---|
| rield | 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_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.7.5.1.1-1, 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.

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 | 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.

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 | Va | lue | Comment |
|--|------|--|--------|---|
| Farameter | Onit | Test 1 | Test 2 | Comment |
| E-UTRA RF Channel Number | | 1 | | |
| Channel Bandwidth (BW _{channel}) | MHz | 5 | 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

| Parameter Un | | Val | Commont | |
|-----------------------------------|---------|-----------------------|-----------------------|-------------------------------------|
| Parameter | Unit | Test 1 | Test 2 | Comment |
| E-UTRA RF Channel Number | | 1 | | UL carrier frequency |
| Channel Bandwidth | MHz | 5 | | |
| (BW _{channel}) | IVII IZ | 5 | | |
| ProSe Direct Discovery | | As specified in Table | As specified in Table | IE values unless |
| resource pool configuration | | A.3.12.4-1 | A.3.12.4-2 | specified otherwise |
| | | (Configuration #1) | (Configuration #2) | in this test. |
| Antivo Cidalink III. | | PDP.1.FDD | PDP.2.FDD | Transmitting ProSe |
| Active Sidelink UEs Configuration | | As specified in Table | As specified in Table | Direct Discovery (Test 1 and 2) and |
| Configuration | | A.3.12.8.2-1 | A.3.12.8.2-1 | SLSS (for Test 2) |

Table A.7.5.3.1-3: Cell specific test parameters for interruption due to ProSe Direct Discovery tests

| Parameter | | Unit | Cell 1 | | | |
|---|---|------------|-----------------|-----------|---------|--|
| | | Unit | T1 | T2 | T3 | |
| E-UTRA RF Channel Number | | | | 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} | | | | | | |
| $N_{_{OC}}$ Note2 | | dBm/15 kHz | 16 | | | |
| \hat{E}_s/N_{oc} | | dB | | | | |
| RSRP Note3 | | dBm/15 kHz | | | | |
| 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 | | PCP.1.FDD As specified in Table A.3.12.8.1-1 | Transmitting ProSe Direct Communication (PSCCH + PSSCH) | |
| Note 1: This test is according to the principle defined in section A.3.12.3. | | | | |

Table A.7.5.5.1-2: Cell specific test parameters for interruption due to ProSe Direct Communication tests

| Parameter | | Unit | Cell 1 | | |
|--|---|------------|---------|--------------------------------|--|
| | | Offic | T1 | T2 | T3 |
| | -UTRA RF Channel Number | | | 1 | |
| BW _{channel} Note 4 | | MHz | 5 or 10 | | |
| UE RRC state | | | IDLE | IDLE CONNECTED | |
| Paging configuration | defaultPagingCycle | | rf256 | N | /A |
| raging configuration | nB | | T / 32 | IN | /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 | H Reference | | | 5 MHz: R.11 FD | D |
| measurement channel o | defined in A.3.1.2.1 Note1, | | | 10 MHz: R.6 FD | |
| OCNG Pattern Note 4 | | | 1 | 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} 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 | |
| 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 a | 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. Note 5: The PDSCH scheduled subframes for R.7 FDD (5MHz) / R.3 FDD (10MHz) is changed as per the | | | | not settable | |
| 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 | 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 | 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{E}_{s}/I_{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 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 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 | Cell 1 T1 T2 | | Cell 2 | | |
|--|------------|-----------------|-------|-----------|---------|--|
| | | | | T1 | T2 | |
| E-UTRA RF Channel | | 1 | | | 1 | |
| Number | | | | | | |
| BW _{channel} | MHz | 1 | 0 | | 10 | |
| Correlation Matrix and | | 1x2 | Low | 12 | 1x2 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 | | | 0 | | |
| 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 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

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 | | As specified in clause A.3.1.1.1 |
| | | Channel R.0 FDD |) | |
| PCFICH/PDCCH/PHICH | | DL Reference Me | asurement | As specified in clause A.3.1.2.1 |
| parameters | | Channel R.6 FDD |) | |
| Active cell | | Cell 1 | | |
| Neighbour cell | | Ce | II 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 | | 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 T1 T2 | | Cell 2 | | |
|--|------------|-----------------|-------|-----------|---------|--|
| | | | | T1 | T2 | |
| E-UTRA RF Channel | | 1 | | | 1 | |
| Number | | | | | | |
| BW _{channel} | MHz | | 10 | | 10 | |
| Correlation Matrix and | | 1x2 | . Low | 1) | 1x2 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 | | • | | | |
| 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 |
|--------------------------|---------|---------|------------------------------------|
| 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_{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 |
|--------------------|-------|-------|---|
| 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.8.1.3.2 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 | 1 | | | | | |
| PDSCH_RB | dB | 1 | | | | | |
| OCNG_RA ^{Note 1} | dB | 1 | | | | | |
| 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 | 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.3.2.1.1 (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 | 1 | | | | | |

| \hat{E}_{s}/I_{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 | | | | | |

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 | Cell PCIs are selected so that the condition is |
| | | !=0 | 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 |
| Time demain management | | | cofigured in the ABS subframes. |
| Time domain measurement | | 10000000100000001000 | Time domain measurement resource restriction |
| resource restriction pattern for neighbour cell measurements on | | 0000100000010000001000 | pattern for neighbor cell measurement signalled to the UE in measSubframePattern-Neigh IE in |
| RF Channel 1 | | | measSubframePatternConfig-Neigh, as defined |
| IXI Gridilliei i | | | 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 | 25ga. 2a daming 11 for 25 1 moadaromonto |
| 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 | Cell 1 | | Cell 2 | | |
|--|-----------------|--------------------|-------------------|-----------------|-----------------|--|--|
| | | T1 | T2 | T1 | T2 | | |
| E-UTRA RF Channel | | | | | 1 | | |
| Number | | | | | | | |
| BW _{channel} | MHz | 1 | 0 | | 10 | | |
| Correlation Matrix and | | 1x2 | Low | 1) | k2 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 | | ABS subframe | | | | |
| PBCH_RB | dB | | ers defined in | | | | |
| PSS_RA | dB | Table A.: | 3.4.1.1-1. | | | | |
| 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 | | | |
| $(\hat{E}_s / N_{oc})_{meas}^{$ | 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 | | | ET | U30 | | | |
| | e used such tha | t both cells are f | ully allocated an | d a constant to | tal 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

| Parameter | | Unit | Value | Comment | | |
|--|---|------|---|---|--|--|
| PDSCH parameters | | | DL Reference Measurement | 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 | 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 | | (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 | The CRS assistance information is | | |
| CRS assistance | antennaPortsC ount | | 1 | provided for Cell 2 only in CRS- AssistanceInfo. It includes a single | | |
| information | mbsfn- SubframeConfi gList | | oneFrame = '000000' | MBSFN-SubframeConfig element with subframe allocation <i>one</i> 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

| Downwater | I Imit | Cel | I 1 | Се | II 2 | Cell 3 | | |
|--|---------------|--------------------------------------|---|--------------------|-------|-----------|--------|--|
| Parameter | Unit | T1 | T2 | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | 1 | | | 1 | , | Ī | |
| Number | | ' | | | ı | 1 | | |
| 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 ADC | and ABS | Non-ABS and ABS | | | | |
| PHICH_RA | dB | Non-ABS and ABS subframe channel | | subframe channel | | | | |
| PHICH_RB | dB | | | powers defined in | | N/A 0 | 0 | |
| PDCCH_RA | dB | powers defined in Table A.3.4.1.1-1. | | Table A.3.4.1.1-1. | | | | |
| PDCCH_RB | dB | Table A.c |). . . ⁻ . | Table A.S.4.1.1-1. | | | | |
| PDSCH_RA | dB | | | | | | | |
| PDSCH_RB | dB | | | | | | | |
| OCNG_RA ^{Note 1} | dB | | | | | | | |
| OCNG_RB ^{Note 1} | dB | | | | | | | |
| N_{oc} Note 3 | dBm/15 | | | | 98 | | | |
| ¹ V 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 | ETU30 | | ETU30 | |

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 $N_{\it oc}$ 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 parameters | | | As specified in clause A.3.1.2.1 | | |
| Note 1: See Table A.8.1.1.1-1 for the other parameters. Note 2: This test is according to the principle defined in section A.3.7.2. | | | | | |

Table A.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 | T2 | T1 | T2 | |
| BW _{channel} | MHz | 5 | ; | 5 | | |
| OCNG Patterns | | | | | | |
| defined in A.3.2.1.15 | | | | | | |
| (OP.15 FDD) and | | OP.15 FDD | | OP.16 FDD | | |
| A.3.2.1.16 (OP.16 | | | | | | |
| FDD) | | | | | | |
| | be used such that both cells are fully allocated and a constant total transmitted | | | | | |
| power spectra | ctral density is achieved for all OFDM symbols. | | | | | |
| Note 2: See Table A. | 3.1.1.1-2 for the | other parameters | S. | | | |

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 accord | ling to the p | orinciple 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 | As specified in clause A.3.1.1.3 |
| | | Channel R.13 FDD | |
| 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 | | | 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 | | | 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 | | _ | | | |
| 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 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 | Parameter Unit Value | | lue | Comment |
|--|----------------------|------------------------------------|--------|--|
| | | Test 1 | Test 2 | |
| PDSCH parameters | | DL Reference Me Channel R.13 FD | | As specified in clause A.3.1.1.3 |
| PCFICH/PDCCH/PHICH parameters | | DL Reference Me 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.8.1.13.1-3 |
| 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 | 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 | | 2: | x1 | | 2x1 | |
| 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 | 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 | | | l | 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 |
|--------------------------|---------|---------|------------------------------------|
| 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 | 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 | | | | | | |
| 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.8.1.14.2 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 | Ce | ell 1 | | Cell 2 | |
|--|------------|------|-------|-----------|---------|--|
| | | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | 1 | | 1 | | |
| Number | | | | | | |
| BW _{channel} | MHz | , | 10 | | 10 | |
| Correlation Matrix and | | 2 | x1 | | 2x1 | |
| 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 | 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 Channel R.1 HD- | | As specified in clause A.3.1.1.4 |
| PCFICH/PDCCH/PHICH parameters | | DL Reference Me Channel R.3 HD- | | 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 One FDD carrier frequ | |
| 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 | nit Cell 1 | | | Cell 2 | | |
|----------------------------|---------------------------|-------------------|-------|-----------|------------------------|--|--|
| | | T1 | T2 | T1 | T2 | | |
| E-UTRA RF Channel | | | 1 | 1 | | | |
| Number | | | | | | | |
| BW _{channel} | MHz | , | 10 | | 10 | | |
| Correlation Matrix and | | 2 | x1 | | 2x1 | | |
| 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 | 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 | | | | ETU70 | • | | |
| Note 1: OCNG shall be used | d auch that both calls ar | o fully allocated | | | or apportal depoity 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 |
|--------------------------|---------|---------|------------------------------------|
| 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_{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 |
|--------------------|-------|-------|---|
| 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.8.1.16.2 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 |
| | | DL Reference Measurement | |
| PCFICH/PDCCH/PHICH | | Channel R.6 TDD | As specified in clause A.3.1.2.2 |
| parameters | | | |
| 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 | nit 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 | 2 | 2x1 | | |
| 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 | | | 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 | | | | | | |
| $N_{oc}^{\text{Note 3}}$ | dBm/15 kHz | | | -98 | | | |
| RSRP Note 4 | dBm/15 kHz | -94 | -94 | -Infinity | -94 | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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.8.1.17.2 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.

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.8.1.18 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 | 1 |
| | | 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 | 1 | 0 | |
| 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 | | | | | |
| 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 | -94 | -Infinity | -94 | |
| \hat{E}_{s}/I_{ot} | dB | 4 | -1.46 | -Infinity | -1.46 | |
| SCH_RP Note 3 | dBm/15 kHz | -94 | -94 -94 | | -94 | |
| \hat{E}_s/N_{oc} | dB | 4 | 4 | -Infinity -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 | | |
|--------------------|-------------|-------|---|--|--|
| 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.8.1.18.2 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 | | _ | | | | | |
| 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{E}_{s}/I_{ot} | dB | 8 | -3.3 | -3.3 | -Infinity | 2.36 | 2.36 | |
| $N_{oc}^{$ | dBm/15 KHz | -98 | | | 8 | | | |
| \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 | ms | - 3 | | | | | | |
| | ad such that both calls 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 | | • | 1 | | T | т | |
| $\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | 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 | | | | | • | |
| Timing offset to Cell 1 | ms | - 3 | | | | | | |
| | Il be used such that both calls are fully allocated and a constant total transmitted never an atral | | | | | | | |

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 + $T_{identify CGLLC-UE, intra}$ + 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 | | 0 | | | | |
| PDSCH_RB | dB | | -3 | | -3 | | |
| OCNG_RA ^{Note 1} | dB | | | | | | |
| OCNG_RB ^{Note 1} | dB | | | 1 00 | 1.6. | 0.00 | |
| \hat{E}_{s}/I_{ot} | dB | 8 | -3.3 | -3.3 | -Infinity | 2.36 | 2.36 |
| N_{oc} Note 2 | dBm/15 KHz | -98 | | | 8 | | |
| \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 | |
| | sed 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_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 | -9i | | | 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 | |
| | used such that both calls are fully allocated and a constant total transmitted navier an extra | | | | | | |

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 |
|--|------|---|---|
| DDCCI I regressed to re | | DL Reference Measurement | As an additional and a A A A A A |
| 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 |
| 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 | Се | | | | |
|---------------------------|------------|------|-------|-----------|---------|--|
| | | 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 | | | | | |
| 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 | | | | | |
| $N_{oc}^{ m Note 3}$ | 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 | 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

| 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 | | 1x2 | Low | 1> | 2 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 | | | 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 | | | |
| RSRP Note 3 | dBm/15 kHz | -94 -94 | | -Infinity | -94 | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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 | Propagation Condition ETU70 | | | | | | |
| | CNG shall be used 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.8.2.2.1-3: 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 |
|--------------------------|---------|---------|------------------------------------|
| 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_{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

| | | | Cell 1 | | Cell 2 | | | |
|--|---|------|---------------|-------------|----------------|-------------|------------|--|
| | | T1 | T2 | Т3 | 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_RANote 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 | | | | | | |
| | sed such that both ed for all OFDM syn | | y allocated a | nd a consta | 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 | |

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 | | | -6 | 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 | | | mitted powe | r spectral |
| | 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 $N_{\it oc}$ 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 carrier frequency is asea. | |
| A3-Offset | dB | -11 | | |
| Event A3 measurement quantity | ub . | RSRP | | |
| CP length | | Normal | | |
| Special subframe configuration | | 6 | As specified in Table 4.2-1 in TS 36.211. The | |
| Special subframe configuration | | 0 | same configuration in both cells | |
| Uplink-downlink configuration | | 1 | As specified in Table 4.2-2 in TS 36.211. The | |
| Opinik-downlink configuration | | ' | same configuration in both cells | |
| Hysteresis | dB | 0 | Same configuration in both cens | |
| Time To Trigger | S | 0 | | |
| Filter coefficient | 5 | 0 | L3 filtering is not used | |
| DRX | | 0 | OFF | |
| Time offset between cells | + | 22 | Synchronous cells | |
| | _ | 3 μs | Synchronous cells | |
| T1 T2 | S | 5 | | |
| | 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 | | C | Cell 2 | |
|--|---------------------|---------------------|-----------------|-------------------|-----------------|--|
| | | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | 1 | | | 1 | |
| Number | | | | | | |
| BW _{channel} | MHz | 1 | 10 | | 10 | |
| Correlation Matrix and | | 1x2 | Low | 1x | 2 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 | | ABS subframe | | | |
| PBCH_RB | dB | channel power | | | | |
| PSS_RA | dB | Table A.3 | 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 | | |
| $(\hat{E}_s/N_{oc})_{meas}$ 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 | | | E | TU30 | | |
| Note 1: OCNG shall be | e used such that he | oth cells are fully | allocated and a | constant total tr | ansmitted nower | |

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

| Param | eter | Unit | Value | Comment |
|---|--|------|---|---|
| PDSCH parameters | | | DL Reference Measurement | As specified in clause A.3.1.1.2 |
| | | | Channel R.0 TDD | |
| PCFICH/PDCCH/ parameters | PHICH | | 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 2 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 Chan | | | 1 | One TDD carrier frequency is used |
| Channel Bandwid | | MHz | 10 | For all cells in the test |
| A3-Offset | · | dB | -14 | |
| Event A3 measure | ement quantity | | RSRP | |
| CP length | | | Normal | |
| Special subframe | | | 6 | As specified in Table 4.2-1 in TS 36.211. The same configuration in both cells |
| Uplink-downlink co | onfiguration | | 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 | | | 0.110.11 | OFF |
| Time offset betwe | en celis | 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 | | | (PCI _{cell1} - PCI _{cell3})mod6 = 0 (PCI _{cell2} - PCI _{cell3})mod6 != 0 | Cell PCIs are selected so that all conditions are met |
| | | | PCI _{cell1} not equal to PCI _{cell3} | |
| ABS pattern | | | | 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 mea resource restrictio neighbour cell me RF Channel 1 | on pattern for easurements on | | PCI _{cell1} not equal to PCI _{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 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. |
| Time domain mea resource restrictio neighbour cell me | on pattern for easurements on asurement on pattern for | | PCI _{cell1} not equal to PCI _{cell3} '00000000010000000001' | 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 |
| Time domain mea resource restrictio neighbour cell me RF Channel 1 Time domain mea resource restrictio PCell measureme | on pattern for easurements on asurement on pattern for | | '00000000010000000001' | 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 | Unit | Cell 1 | | Cell 2 | | Cell 3 | | |
|---|---------------|------------|---|--------------------|---------|-----------|--------|--|
| Parameter | Unit | T1 | T2 | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | 1 | | 1 | | 1 | | |
| Number | | ' | | · · | | I | | |
| BW _{channel} | MHz | _ | 10 | | 10 | | 0 | |
| Correlation Matrix and | | 1x2 Low | | 1x2 Low | | 1x2 Low | | |
| Antenna Configuration | | | | | | | | |
| OCNG Patterns defined in | | | | | | OP.2 | | |
| A.3.2.2.1 (OP.1 TDD) and | | OP.1 | TDD | OP.2 | 2 TDD | N/A | TDD | |
| in A.3.2.2.2 (OP.2 TDD) | | | | | | | - 100 | |
| PBCH_RA | dB | | | | | | | |
| PBCH_RB | dB | | | | | | | |
| PSS_RA | dB | | | | | | | |
| SSS_RA | dB | | | | | | | |
| PCFICH_RB | dB | Non-ARS | and ARS | Non ARS | and ABS | | | |
| PHICH_RA | dB | | Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1. | | | N/A | | |
| PHICH_RB | dB | | | | | | 0 | |
| PDCCH_RA | dB | | | | | | | |
| PDCCH_RB | dB | Table 71.c | ,. | Table A.S.4.1.1-1. | | | | |
| 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 $\hat{E}_{_{s}}/I_{_{ot}}$ | dB | -0.12 | -0.75 | -3.45 | -3.92 | -Infinity | -11.07 | |
| Propagation Condition | | ETU | J30 | ET | U30 | ETI | J30 | |
| MOTE 4 COMO 1 III | | | | | | 144 | | |

- 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

| 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 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{E}_{s}/I_{ot} | dB | 8 | -3.3 | -3.3 | -Infinity | 2.36 | 2.36 |
| $N_{oc}^{ m Note2}$ | dBm/15 KHz | -9 | | | 8 | | |
| \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 | μs | | - | | | 3 | |

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{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 | | | | | |
| Timing offset to Cell 1 | แร | | - | | | 3 | |
| | OCNIC shall be used such that both cells are fully allocated and a constant total transmitted power apartical | | | | | | |

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 | Се | ell 1 | C | Cell 2 | |
|--|------------|------|-------|-----------|--------|--|
| | | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | 1 | | | 2 | |
| Number | | | | | | |
| BW _{channel} | MHz | 1 | 0 | | 10 | |
| Correlation Matrix and | | 1x2 | Low | 1x | 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 | | | 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 | -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 | | |

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 | | 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

| Parameter | Unit | Се | II 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 | 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 | | | 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 | | |
| 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 | -91 7 | |
| Propagation Condition | | | | ETU70 | | |
| Note 1: OCNG shall be used | d such that both calls ar | o fully allocated | and a constant to | tal transmitted now | or enactral dancity 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.8.3.2.1-3: 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 | 81500 | 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 | | OP.2 FDD | | |
| (OP.1 FDD) and in | | ` | 01.11.00 | , | Or .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 | | | | 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 | | | | | | |
| ${ m \hat{E}}_{ m s}/{ m I}_{ m ot}$ | dB | 4 | 4 | | 4 | 24 | |
| $N_{oc}^{$ | 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 | | | | <u> </u> | | | |
| 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} 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 | Т3 | |
| 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{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 | | 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 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 | С | ell 1 | С | ell 2 | | |
|--|-----------------------|------------------|---------------|----------------------|----------------|--|--|
| | | T1 | T2 | T1 | T1 T2 | | |
| E-UTRA RF Channel | | 1 | | | 2 | | |
| Number | | | | | | | |
| BW _{channel} | MHz | | 10 | | 10 | | |
| OCNG Patterns | | | | | | | |
| defined in A.3.2.1.10 | | OP. | I0 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 | | _ | | | | |
| 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 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 | | | | AWGN | | | |
| Note 1: OCNG shall be | e used such that both | n cells are full | allocated and | a constant total tra | nsmitted 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: 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.8.3.6.2 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%.

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.8.3.7 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)

| E-UTRA RF Channel | | T1 | TO | T-4 | |
|--|----------------------------|---|---|--|--|
| | | 1 1 | T2 | T1 | T2 |
| Number | | 1 | 1 | 2,3,4,5,6,7,8 | selected from such that cell 2 is |
| | | | | | erformance group |
| BW _{channel} | MHz | 5MHz: N | | | : N _{RB,} = 25 |
| Management | | | $N_{RB} = 50$ | | :: N _{RB,} = 50 |
| Measurement | 70 | | 10-15 | | z: 10-15 |
| bandwidth | n_{PRB} | TOWINZ | : 22-27 | TOIVIE | łz: 22-27 |
| PDSCH Reference | | 5MHz: F | R.5 FDD | | - |
| measurement channel | | 10MHz: | R.0 FDD | | |
| defined in A.3.1.1. | | | | | |
| PDSCH allocation | n_{PRB} | | : 7-17 : 13-36 | | - |
| PDCCH/PCFICH/PHIC | | 5MHz: R | .11 FDD | 5MHz: | R.11 FDD |
| H Reference | | 10MHz: | R.6 FDD | 10MHz | :: R.6 FDD |
| measurement channel | | | | | |
| defined in A.3.1.2. | | | | | |
| OCNG Patterns | | | P.15 FDD | | OP.16 FDD |
| defined in A.3.2. | | 10MHz: C | P.1 FDD | 10MHz: | OP.2 FDD |
| PBCH_RA | dB | | | | |
| PBCH_RB | dB | | | | |
| PSS_RA | dB | | | | |
| SSS_RA | dB | | | | |
| PCFICH_RB | dB | | | | |
| PHICH_RA | dB | | 1 | | 0 |
| PHICH_RB | dB | , | 0 | | O |
| PDCCH_RA | <u>dB</u> | | | | |
| PDCCH_RB | dB | | | | |
| PDSCH_RA | dB | | | | |
| PDSCH_RB OCNG_RA ^{Note 1} | dB dB | - | | | |
| OCNG_RB ^{Note 1} | <u>иь</u> dВ | | | | |
| $N_{oc}^{\text{Note 3}}$ | dBm/15 kHz | -G | 98 | | -98 |
| \hat{E}_s/N_{oc} | dB | 4 | 4 | -Infinity | 7 |
| $\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | 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 |
| lo ^{Note 4} | dBm/ BW _{channel} | - 64.76+10log(N _{RB,c} /50) | - 64.76+10log(N _{RB,0} /50) | - 70.22+10log(N _{RB,} /50) | - 62.43+10log(N _R _{B,o} /50) |
| Propagation Condition | | ETI | | | TU70 |
| Correlation Matrix and | | 1x2 | | | 2 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 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 | 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 | | ETU70 | | | TU70 | |
| Correlation Matrix and | | 1x2 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 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.

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 Channel Number | | 1,2,3,4,5,6,7,8,9 | Serving cell and 8 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 uses E-UTRA RF cannel 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 | | Cell 2 | |
|--|------------|-------------------------|-------------------------|-----------------------------|--------------------------|
| | | T1 | T2 | T1 | T2 |
| E-UTRA RF Channel | | | 1 | Randomly se | lected from 2,3,4 |
| Number | | | | such that cell | 2 is in the normal |
| | | | | performance group | |
| BW _{channel} | | 5MHz: N | $N_{RB} = 25$ | 5MHz: N _{RB,} = 25 | |
| | | | $N_{RB} = 50$ | | :: 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 | | 5MHz: R | 1.11 FDD | 5MHz: | 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 | | | | | |
| defined in A.3.2.1.1, | | 5MHz: OI | P.15 FDD | 5MHz: 0 | 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 | | | | | |
| PBCH_RA | dB | | | | |
| PBCH_RB | dB | | | | |
| PSS_RA | dB | | | | |
| SSS_RA | dB | | | | |
| PCFICH_RB | dB | | | | |
| PHICH_RA | dB | | | | |
| PHICH_RB | dB | 1 (|) | | 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 3 | dBm/15 kHz | -6 | 98 | | -98 |
| \hat{E}_s/N_{oc} | dB | 4 | 4 | -Infinity | 7 |
| \hat{E}_{s}/I_{ot} 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 | AWGN | |
| Antenna Configuration | | + | x2 | 1x2 | |
| Timing offset to Cell 1 | | | - | | Bms |
| Note that the second se | 1 1 1 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.

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 | Cell 4 | | |
|--|------------|---|--|--|--|--|
| | | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel Number | | 5,6,7,8,9 sucl in the r | elected from h that cell 3 is reduced nce group | 5,6,7,8,9 such the reduced group. Cell 4 different fr | selected from that cell 4 is in performance RF channel is om Cell 3 RF | |
| BW _{channel} | | | $N_{RB} = 25$ $N_{RB} = 50$ | | N _{RB,} = 25 : N _{RB,} = 50 | |
| PDSCH parameters: DL Reference Measurement Channel As specified in clause A.3.1.1.1 | | | R.5 FDD R.0 FDD | 5MHz: R.5 FDD 10MHz:R.0 FDD | | |
| PCFICH/PDCCH/PHIC H parameters: DL Reference Measurement Channel As specified in clause A.3.1.2.1 | | | R.11 FDD R.6 FDD | | R.11 FDD ::R.6 FDD | |
| OCNG Patterns defined in A.3.2.1.2 and A.3.2.1.16 | | | P.16.FDD)P.2 FDD | | DP.16.FDD OP.2 FDD | |
| PBCH_RA | dB | | | | | |
| PBCH_RB | dB | _ | | | | |
| PSS_RA | dB | 4 | | | | |
| SSS_RA | dB | | | | | |
| PCFICH_RB PHICH_RA | dB dB | | | | | |
| PHICH_RB | dB | - | 0 | | 0 | |
| _ | | <u> </u> | | | · | |
| PDCCH_RA | dB | | | | | |
| PDCCH_RB | dB dB | <u> </u> | | | | |
| PDSCH_RA PDSCH_RB | dB | <u> </u> | | | | |
| OCNG_RA ^{Note 1} | dB | | | | | |
| OCNG_RB ^{Note 1} | dB | | | | | |
| N_{oc} Note 3 | dBm/15 kHz | -9 | 98 | | -98 | |
| \hat{E}_s/N_{oc} | dB | -Infinity | 7 | -Infinity | 7 | |
| $\hat{	ext{E}}_{	ext{s}}/	ext{I}_{	ext{ot}}^{	ext{ Note 4}}$ | dB | -Infinity | 7 | -Infinity | 7 | |
| INDIN | 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 +10log (N _{RB,c} /50) | -62.43 +10log (N _{RB,c} /50) | -70.22 +10log (N _{RB,c} /50) | -62.43 +10log (N _{RB,c} /50) | |
| Propagation Condition | | AW | /GN | | WGN | |
| Antenna Configuration | | 1: | x2 | | 1x2 | |
| Timing offset to Cell 1 | | 3r | ms | 3 | Bms | |
| 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 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 | Се | II 1 | Cell 2 | | Cell 3 | | Cell 4 | |
|---|------------|---|----------------------|-----------------------------------|------------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| E-UTRA RF Channel | | , | 1 | | Randomly selected from 2,3,4 | | ected from 5, 6, | Randomly selected from 5, 6, | |
| Number | | | | such that cell 2 is in the normal | | 7, 8, 9 such that cell 3 is in the | | 7, 8, 9 such that cell 4 is in the | |
| 01 15 1:11 | N.41.1 | 51411 | IDD 05 | | nce group | | ormance group | reduced performance group | |
| Channel Bandwidth (BW _{channel}) | MHz | | IRB = 25 NRB = 50 | | NRB,= 25 NRB,= 50 | | NRB = 25 NRB = 50 | 5MHz: NRB,= 25 10MHz: NRB,= 50 | |
| PDSCH parameters as | | | R.5 FDD | | R.5 FDD | | R.5 FDD | | R.5 FDD |
| specified in clause | | | R.0 FDD | | R.0 FDD | | R.0 FDD | | R.0 FDD |
| A.3.1.1.1 | | | - | | | | | - | - |
| PCFICH/PDCCH/PHICH | | | R.11 FDD | 5MHz: F | R.11 FDD | 5MHz: F | R.11 FDD | 5MHz: R | 1.11 FDD |
| parameters as specified | | 10MHz: | R.6 FDD | 10MHz: | R.6 FDD | 10MHz: | R.6 FDD | 10MHz: | 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 PBCH_RA | dB | TUMHZ: C | OP.1 FDD | TOMHZ: 0 | OP.2 FDD | TOMHZ: 0 | OP.2 FDD | TOMEZ: C | DP.2 FDD |
| PBCH_RB | dB | - | | | | | | | |
| PSS_RA | dB | - | | | | | | | |
| SSS_RA | dB | | | | | | | | |
| PCFICH_RB | dB | | | | | | | | |
| PHICH_RA | dB | - | | | | | | | |
| PHICH RB | dB | | 0 0 0 | | 0 | 0 | | | |
| PDCCH_RA | dB | ` | | | Ŭ | | | | |
| PDCCH_RB | dB | 1 | | ! | | | | | |
| PDSCH_RA | dB | 1 | | | | | | | |
| PDSCH_RB | dB | | | | | | | | |
| OCNG_RA ^{Note 1} | dB | - | | | | | | | |
| OCNG_RB ^{Note 1} | dB | - | | | | | | | |
| Noc Note 3 | dBm/15 kHz | -9 | 98 | -9 | 98 | -98 | | -98 | |
| | | | I | | T | | | | I |
| \hat{E}_s/N_{oc} | dB | 4 | 4 | -Infinity | 4 | -Infinity | 4 | -Infinity | 4 |
| $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$ 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) (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) |
| Propagation Condition | | AWGN | | AWGN | | AWGN | | AWGN | |
| Antenna Configuration | | 1: | x2 | | x2 | 1x2 | | | x2 |
| 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

$$\mathbf{T}_{\text{Identify_Inter}} = \mathbf{T}_{\text{Basic_Identify_Inter}} \cdot \frac{480}{\mathbf{T}_{\text{Inter1}}} \cdot N_{\textit{freq},n} \cdot K_{\textit{n}} \quad \textit{ms} \, (\text{normal performance}) \, \text{and} \, \frac{1}{2} \left(\frac{1}{2} \sum_{i=1}^{n} \frac{1}{2} \sum_{i=1}^$$

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter}}} \cdot N_{freq,r} \cdot K_r \quad \textit{ms} \, (\text{reduced performance})$$

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 | Ce | II 1 | Ce | II 2 | |
|--|------------|------|------|-----------|------|--|
| | | T1 | T2 | T1 T2 | | |
| E-UTRA RF Channel | | 1 | | 2 | | |
| Number | | | | | | |
| BW _{channel} | MHz | 10 | | 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 | | | 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 | 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 | | | | 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 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 | | | | |
| | DL Reference Me | easurement | As specified in clause A.3.1.1.2. Note that | | |
| | Channel R.0 TDD | | Channel R.0 TDD | | UE may only be allocated at On Duration |
| | DL Reference Measurement | | As specified in clause A.3.1.2.2. | | |
| | Channel R.6 TDD |) | | | |
| | 1, 2 | | 1, 2 | | Two TDD carrier frequencies are used. |
| MHz | 10 | | | | |
| | Cell 1 | | Cell 1 is on RF channel number 1 | | |
| | Cell 2 | | Cell 2 is on RF channel number 2 | | |
| | 0 | | 0 | | As specified in TS 36.133 clause 8.1.2.1. |
| | 1 | | 1 As specified in TS 36.211 cl | | 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 | | | | | |
| S | 5 | 30 | | | |
| | MHz dB dB s | Va | Value DL 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 -6 dB 0 Normal s 0 0 4 Normal s Normal s 0 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 | Ce | II 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) | k2 Low | |
| Antenna Configuration | | | | | | |
| OCNG Patterns | | | | | | |
| defined in A.3.2.2.1 | | OP.1 | TDD | OF | 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 | | | 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 | | | | |
| 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 | -91 7 | |
| Propagation Condition | | | l l | TU70 | | |
| Note 1: OCNG shall be used | d such that both calls ar | a fully allocated | and a constant to | tal transmitted now | or enactral dancity 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 |
|--------------------------|---------|---------|---------|
| rieid | 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 |
|--------------------|-------|-------|------------------------------------|
| rield | Value | Value | |
| TimeAlianmentTimer | sf500 | sf500 | For further information see |
| TimeAlignmentTimer | 81500 | 81500 | clause 6.3.2 in TS 36.331. |
| | | | For further information see |
| sr-ConfigIndex | 2 | 2 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 | Ce | ell 1 | Ce | Cell 2 | | |
|--|------------------------|------------|---------------|----------------|----------|--|--|
| | | T1 | T2 | T1 | T2 | | |
| E-UTRA RF Channel Number | | 1 | | 2 | | | |
| BW _{channel} | MHz | 1 | 0 | 1 | 0 | | |
| OCNG Patterns 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 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 | | |
| $N_{oc}^{$ | 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 | | | AV | /GN | • | | |
| Note 1: OCNG shall be used such that bo | th cells are fully all | ocated and | a constant to | otal transmitt | ed power | | |
| spectral density is achieved for all | | | | | • | | |

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

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 | 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.3.2.2.1 (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 | | | | | | |
| | sed such that both | cells are fully | allocated a | nd a consta | nt total trans | mitted powe | r 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.

RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are Note 3: 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

| 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 | -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 | | | | | |
| | sed such that both | cells are fully | 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.8.4.5.1-3: 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 | Ce | 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 | 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 | | | | | |
| 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 | | | | | |
| \hat{E}_{s}/I_{ot} | dB | 4 | 4 | -Infinity | 7 | |
| $N_{oc}^{ m Note~3}$ | dBm/15 kHz | -98 | | -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 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.8.4.6.2 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.

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.

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)

| | | | | | II 2 |
|--|----------------------------|---|--|---|---|
| | | T1 | T2 | T1 | T2 |
| E-UTRA RF Channel Number | | | 1 | Randomly s 2,3,4,5,6,7,8 su in the normal ne | ich that cell 2 is |
| BW _{channel} | MHz | | N _{RB} = 25 N _{RB} = 50 | in the normal performance grou 5MHz: N _{RB} ,= 25 10MHz: N _{RB} ,= 50 | |
| Measurement | | | 10-15 | 5MHz: | |
| bandwidth | n_{PRB} | 10MHz | : 22-27 | 10MHz | : 22-27 |
| PDSCH Reference | | 5MHz: F | R.5 TDD | | = |
| measurement channel defined in A.3.1.1. | | 10MHz: | R.0 TDD | | |
| PDSCH allocation | n_{PRB} | | : 7-17 : 13-36 | | |
| PDCCH/PCFICH/PHIC H Reference measurement channel defined in A.3.1.2. | | | 11 TDD R.6 TDD | 5MHz: R 10MHz: | |
| OCNG Patterns defined in A.3.2. | | | P.15 TDD OP.1 TDD | | P.16 TDD DP.2 TDD |
| PBCH_RA | dB | 10111121 01 11 123 | | | |
| PBCH_RB | dB | | | | |
| PSS_RA | dB | | | | |
| SSS_RA | dB | | | | |
| PCFICH_RB | dB | 1 | | | |
| PHICH_RA | dB | 1 | | | |
| PHICH_RB | dB | (|) | (|) |
| PDCCH_RA | dB | 1 | | | |
| 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 | -G | 98 | -9 | 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,0} /50) | - 70.22+10log(N _{RB,c} /50) | - 62.43+10log(N _{RB,} /50) |
| Propagation Condition | | | J70 | ETI | |
| Correlation Matrix and | | | Low | 1x2 | 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 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 | Ce | II 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 pe | rformance group | |
| | | gro | oup | | | |
| BW _{channel} | MHz | | √ _{RB} = 25 | 5MHz: 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: (| 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 | | | | | |
| $N_{oc}^{ m Note~3}$ | 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,} /50) N _{RB,} /50) | | 70.22+1010g(N RB, /50) | RB,c/50) | |
| Propagation Condition | | | J70 | | J70 | |
| Correlation Matrix and | | | Low | | Low | |
| Antenna Configuration | | 1,72 | | IAL | | |
| 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 | | | | Il 2 is in the normal | | | |
| | | | perform | rmance 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 | 10MHz: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 | 10MHz: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 | | | 0 | | | |
| PHICH_RB | dB | - |) | | | | |
| PDCCH_RA | dB | | | | | | |
| PDCCH_RB | dB | | | | | | |
| | | | | | | | |
| PDSCH_RA | dB | | | | | | |
| PDSCH_RB | dB | | | | | | |
| OCNG_RA ^{Note 2} | dB | | | | | | |
| OCNG_RB ^{Note 2} | dB | | | | 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 | | AW | | | WGN | | |
| Antenna Configuration | | 1x2 1x2 | | | | | |
| Timing offset to Cell 1 | | 17 | <u>.</u> | | 3 μs | | |
| | al subframe and unlink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 | | | | | | |

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 | Ce | II 3 | Cell 4 | | | |
|---|----------------|-------------------------|--|----------------------------------|--------------------------|--|--|
| | | T1 | T2 | T1 | T2 | | |
| E-UTRA RF Channel | | Randomly s | elected from | Randomly selected from | | | |
| Number | | 5,6,7,8,9 such | | 5,6,7,8,9 such that cell 4 is in | | | |
| | | the reduced | | the reduced performance group. | | | |
| | | gro | | Cell 4 RF channel is different | | | |
| | | 3.3 | | from Cell 3 RF channel. | | | |
| BW _{channel} | | 5MHz: N | Jpp = 25 | 5MHz: N _{RB} ,= 25 | | | |
| D Chame | | | | | z: N _{RB.} = 50 | | |
| Special subframe | | | 10MHz: N _{RB} = 50 10MHz: N _{RB} ,= 50 | | | | |
| 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 | | | | 10101112.111.0 122 | | | |
| As specified in | | | | | | | |
| clause A.3.1.1.2 | | | | | | | |
| PCFICH/PDCCH/PHIC | | 5MHz: R | .11 TDD | 5MHz: | R.11 TDD | | |
| H parameters: DL | | | R.6 TDD | _ | z:R.6 TDD | | |
| Reference | | | | | | | |
| Measurement Channel | | | | | | | |
| As specified in | | | | | | | |
| clause A.3.1.2.2 | | | | | | | |
| OCNG Patterns | | 5MHz: OI | P.10.TDD | 5MHz: OP.10.TDD | | | |
| defined in A.3.2.2.2 | | | 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 | | | | | | |
| PHICH_RB | dB | † (|) | 0 | | | |
| PDCCH_RA | dB | | | | | | |
| PDCCH_RB | dB | 1 | | | | | |
| PDSCH_RA | dB | | | | | | |
| PDSCH_RB | dB | 1 | | | | | |
| OCNG_RA ^{Note 2} | dB | 1 | | | | | |
| OCNG_RB ^{Note 2} | dB | | | | | | |
| | dBm/15 kHz | _c | -98 | | -98 | | |
| $N_{oc}^{ m Note~4}$ | GBITI/ TO RETE | | | -56 | | | |
| \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 | | AWGN AWGN | | | | | |
| Antenna Configuration | | | (2 | | 1x2 | | |
| Timing offset to Cell 1 | | 3 | | | 3 μs | | |
| Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 | | | | | | | |

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 | Cel | | Cell 2 | | Ce | II 3 | Cell 4 | | |
|---|------------|-------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|------------------|--|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel Number | | 1 | | Randomly sele | ected from 2,3,4 | Randomly sele | ected from 5, 6, | Randomly sele | ected from 5, 6, | |
| | | | | such that cell 2 is in the | | 7, 8, 9 such t | hat cell 3 is in | 7, 8, 9 such that cell 4 is in the | | |
| | | | | normal performance group | | the reduced performance | | reduced performance group | | |
| | | | | | | | oup | | | |
| Channel Bandwidth | MHz | 5MHz: N | | 5MHz: NRB,= 25 | | 5MHz: NRB = 25 | | 5MHz: NRB,= 25 | | |
| (BW _{channel}) | | 10MHz: N | | 10MHz: NRB,= 50 | | 10MHz: NRB = 50 | | 10MHz: NRB,= 50 | | |
| PDSCH parameters as | | 5MHz: F | | 5MHz: R.4 TDD | | 5MHz: R.4 TDD | | 5MHz: R.4 TDD | | |
| specified in clause A.3.1.1.2 | | 10MHz: I | | 10MHz: R.0 TDD 5MHz: R.11 TDD | | 10MHz: R.0 TDD 5MHz: R.11 TDD | | 10MHz: R.0 TDD 5MHz: R.11 TDD | | |
| PCFICH/PDCCH/PHICH | | 5MHz: R | | | | | | | | |
| parameters as specified in clause A.3.1.2.2 | | 10MHz: I | עטו א.א | TUIVIHZ | R.6 TDD | TOWINZ | R.6 TDD | TUIVIHZ | R.6 TDD | |
| OCNG Patterns defined in | | 5MHz: O | D 0 TDD | 5MH: O | D 10 TDD | 5MH-7: O | D 10 TDD | 5MH: O | D 10 TDD | |
| A.3.2.2 | | 10MHz: C | | 5MHz: OP.10 TDD 10MHz: OP.2 TDD | | 5MHz: OP.10 TDD 10MHz: OP.2 TDD | | 5MHz: OP.10 TDD 10MHz: OP.2 TDD | | |
| PBCH_RA | dB | 10101112. C | 71.11100 | 10101112. | 51.2 100 | 10101112. | JI .Z 100 | TOWN 12. C | JI .Z 100 | |
| PBCH_RB | dB | | | | | | | | | |
| PSS_RA | dB | | | | | | | | | |
| SSS_RA | dB | | | | | | | | | |
| PCFICH_RB | dB | | | | | | | | | |
| PHICH_RA | dB | | | 0 | | 0 | | 0 | | |
| PHICH RB | dB | C | 1 | | | | | | | |
| PDCCH_RA | dB | | , | · · | O | Ŭ | | l | | |
| 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 | | -98 | | -98 | | -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) | (N _{RB,c} /50) | (N _{RB,c} /50) | (N _{RB,c} /50) | (N _{RB,c} /50) | (N _{RB,c} /50) | (N _{RB,c} /50) | $(N_{RB,c}/50)$ | |
| Propagation Condition | | AWGN | | AWGN | | AWGN | | AWGN | | |
| Antenna Configuration | | 1x2 | | 1x2 | | 1x2 | | 1x2 | | |
| 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_{ac} 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

$$\mathbf{T}_{\text{Identify_Inter}} = \mathbf{T}_{\text{Basic_Identify_Inter}} \cdot \frac{480}{\mathbf{T}_{\text{Inter1}}} \cdot N_{\text{freq},n} \cdot K_n \quad \textit{ms} \text{ (normal performance) and }$$

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter}1}} \cdot N_{\textit{freq},r} \cdot K_r \quad \textit{ms} \, (\text{reduced performance})$$

 $T_{Basic_Identify_inter}$ 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/lo | |
| 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 | | -0.941 | | | |
| \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 | asurement | 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 | | 1 | | 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 | |
| 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 | | 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 | |
|--|---------|---------|---------|--|
| rieid | 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 | | -0.941 | | | |
| \hat{I}_{or}/I_{oc} | dB | -Infinity -1.8 | | | |
| I_{oc} | dBm/3.84 MHz | -70 | | | |
| CPICH_Ec/lo | dB | -Infinity -14 | | | |
| Propagation Condition | | 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/Io | |
| 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 | 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 | | | |
| $N_{oc}^{ m Note 3}$ | 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 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_{cc} to be

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.5.4.1-3: 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 | -∞ 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 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 FDD carrier frequency is used. |
| Inter-RAT (UTRA FDD) measurement quantity | | CPICH Ec/lo | |
| 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 | | |

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.8.5.5.1-3: 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 | 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 | ĠN | | |

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 | | | | | |

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.

A.8.5.8 E-UTRA FDD InterRAT UTRA FDD correct reporting of measurement 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 Channel 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 is configured UTRA RF channel numbers | | 2, 3, 4, 5, 6, 7 | |
| Test equipment configuration | | Cell 1 uses E-UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from UTRA RF channel numbers 2,3,4,5,6,7 | 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 |
| 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. |
| Correlation Matrix and Antenna Configuration | | 1x2 low | |
| Active cell | | Cell 1 | Cell 1 is on RF channel number 1 |
| Time offset with respect to cell1 | | 0 | |
| Gap Pattern Id | | 0 | As specified in TS 36.133 clause 8.1.2.1. |
| Inter-RAT (UTRA FDD) measurement quantity | | CPICH Ec/lo | |
| 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 performance group | | 16 | |
| 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 | Ce | II 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 | |
| | | randomly | | rand | omly | rand | omly | |
| | | select | ted to | selec | ted to | select | ted to | |
| | | use di | fferent | use di | fferent | use di | fferent | |
| UTRA RF Channel Number | | | encies | | encies | freque | | |
| OTTA IN Chamile Number | | selecte | | | ed from | selecte | - | |
| | | UTR | | | A RF | UTRA RF | | |
| | | | nnel | | nnel | channel | | |
| | | num | | numbers | | numbers | | |
| | | 2,3,4,5,6,7 2,3,4,5,6,7 2,3,4,5,6,7 | | | | 5,6,7 | | |
| CPICH_Ec/lor | dB | | | | 0 | | | |
| PCCPCH_Ec/lor | dB | | | | 2 | | | |
| SCH_Ec/lor | dB | | | | 2 | | | |
| 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 | -70 | | | | | | |
| ¹oc | MHz | | | | | | | |
| | | - | -14 | - | -14 | - | -14 | |
| CPICH_Ec/lo | dB | infinit | | infinit | | infinit | | |
| | | у | | | | | | |
| Propagation Conditions | gation 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 | 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.3.2.2.1 (OP.1 TDD) | | OP.1 T | 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 | | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 4 | 4 | | |
| \hat{E}_s/N_{oc} | dB | 4 | 4 | | |
| N_{oc} | dBm/15 kHz | -98 | | | |
| 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.8.6.1.1-3: 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 | | -0.941 | | | |
| \hat{I}_{or}/I_{oc} | dB | -Infinity | -1.8 | | |
| I_{oc} | dBm/3.84 MHz | -70 | | | |
| CPICH_Ec/lo | dB | -Infinity -14 | | | |
| Propagation Condition | | Case 5 (No | 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 lor.

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 | | AWGI | 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.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 | |
| channel numbers | | | |
| 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 |
| | | 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 |
| DD0011 : /F | | numbers 2,3,4,5,6,7,8 | A |
| PDSCH parameters (E- | | DL Reference Measurement Channel R.0 TDD | As specified in clause A.3.1.1.2. |
| UTRAN TDD) PCFICH/PDCCH/PHICH | | DL Reference Measurement | As specified in clause A.3.1.2.2 |
| parameters | | Channel R.6 TDD | As specified in clause A.S.1.2.2 |
| (E-UTRAN TDD) | | Channel R.6 100 | |
| Correlation Matrix and | | 1x2 low | |
| Antenna Configuration | | TAZ IOW | |
| Special subframe | | 6 | As specified in table 4.2-1 in TS 36.211. |
| configuration | | ŭ | 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 | 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 | 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 | | 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 | | | 3 is | Cells 4 is | |
| | | rand | omly | rand | omly | rand | omly |
| | | select | ted to | selec | ted to | select | ted to |
| | | use di | fferent | use di | fferent | use di | ferent |
| UTRA RF Channel Number | | | encies | | encies | freque | |
| OTTO THE CHAINE I VAIN DE | | selecte | | | ed from | selecte | |
| | | UTR | | | A RF | UTRA RF | |
| | | | nnel | | nnel | chai | |
| | | num | | numbers | | numbers | |
| | | 2,3,4,5,6,7 2,3,4,5,6,7 2,3,4,5,6,7 | | | | 5,6,7 | |
| CPICH_Ec/lor | dB | | | - | 0 | | |
| PCCPCH_Ec/lor | dB | | | | 2 | | |
| SCH_Ec/lor | dB | | | | 2 | | |
| PICH_Ec/lor | dB | | | | 5 | | |
| DPCH_Ec/lor | dB | | | | /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 | -70 | | | | | |
| - oc | MHz | | | | | | |
| | | | -14 | | -14 | | -14 |
| CPICH_Ec/lo | dB | infinit | | infinit | | infinit | |
| | | y y y | | | | | |
| 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)

| T1 T2 | nber channel relation Matrix and enna Configuration NG Pattern defined in 2.2.1 (OP.1 TDD) CH_RA CH_RB B_RA |
|---|--|
| Number BW _{channel} MHz 10 Correlation Matrix and Antenna Configuration 1x2 Low OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) OP.1 TDD PBCH_RA dB | nber channel relation Matrix and enna Configuration NG Pattern defined in 2.2.1 (OP.1 TDD) CH_RA CH_RB B_RA |
| BW _{channel} MHz 10 Correlation Matrix and Antenna Configuration OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA dB | channel relation Matrix and renna Configuration NG Pattern defined in 2.2.1 (OP.1 TDD) CH_RA CH_RB B_RA |
| Correlation Matrix and Antenna Configuration OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA D1x2 Low OP.1 TDD | relation Matrix and enna Configuration NG Pattern defined in 2.2.1 (OP.1 TDD) CH_RA CH_RB B_RA |
| Antenna Configuration OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA DP.1 TDD OP.1 TDD | enna Configuration NG Pattern defined in 2.2.1 (OP.1 TDD) CH_RA CH_RB B_RA |
| OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) PBCH_RA dB | NG Pattern defined in 2.2.1 (OP.1 TDD) CH_RA CH_RB 3_RA |
| A.3.2.2.1 (OP.1 TDD) PBCH_RA dB | 2.2.1 (OP.1 TDD) CH_RA CH_RB S_RA |
| A.3.2.2.1 (OP.1 TDD) PBCH_RA dB | CH_RA CH_RB S_RA |
| | CH_RB S_RA |
| | S_RA |
| PBCH_RB dB | _ |
| PSS_RA dB | , D. |
| SSS_RA dB | _KA |
| PCFICH_RB dB | FICH_RB |
| PHICH_RA dB | |
| PHICH_RB dB 0 0 | CH_RB |
| PDCCH_RA dB | |
| PDCCH_RB dB | |
| PDSCH_RA dB | |
| PDSCH_RB dB | SCH_RB |
| OCNG_RA ^{Note1} dB | NG_RA ^{Note1} |
| OCNG_RB ^{Note1} dB | NG_RB ^{Note1} |
| \hat{E}_{s}/I_{ot} dB 9 9 | |
| \hat{E}_s/N_{oc} dB 9 | $/N_{oc}$ |
| N_{oc} dBm/15kHz -98 | |
| RSRP dBm/15kHz -89 -89 | RP 9 |
| SCH_RP dBm/15kHz -89 -89 | I_RP |
| Propagation Condition ETU70 | pagation Condition |

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 | | 0 | | 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 ^{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 $I_{\rm or}$.

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 | |

| PDSCH parameters | | DL Reference Measu Channel R.0 TDD | rement | As specified in clause A.3.1.1.2. Note that 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 configuration | | 1 | | As specified in TS 36.211 clause 4.2 Table 4.2-2 | | |
| Special subframe configuration | | 6 | | As specified in table 4.2-1 in TS 36.211. 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 | | 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 | Се | II 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 | -98 | | | |
| I RSRP | dBm/15kHz | -94 | -94 | | |
| SCH_RP Note 3 | dBm/15kHz | -94 | -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.8.7.2.1-3: 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)

| Pa | rameter | Unit | Cell 2 (UTRA) | | | | |
|-------------------------------|---|--|-------------------------|-----|------|------|--|
| Timeslot I | Number | | 0 | | Dw | PTS | |
| | | | T1 | T2 | T1 | T2 | |
| UTRA RF Number N | | | Channel 2 | | | | |
| PCCPCH | _Ec/lor | dB | -3 | -3 | | | |
| DwPCH_ | | dB | | | 0 | 0 | |
| OCNS_E | c/lor ^{NO1E2} | dB | -3 | -3 | | | |
| \hat{I}_{or}/I_{oc} | | dB | -inf | 9 | -inf | 9 | |
| I_{oc} | | dBm/1.28 MHz | -80 | | | | |
| PCCPCH | RSCP | dBm | -inf | -74 | n.a. | n.a. | |
| Propagati Condition | | | Case 3 ^{NOTE3} | | | | |
| Note 1: Note 2: Note 3: | Number is the The power of total power fr | of multi-frequency cell, the UTRA RF Channel the primary frequency's channel number. of the OCNS channel that is added shall make the from the cell to be equal to lor. pagation conditions are defined in Annex B of TS | | | | | |

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 Value Value | | Comment | | |
|--------------------|-------------------------|-------|--|--|--|
| rieid | | | | | |
| 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 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. |
| 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 (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 |
| Inter-RAT (UTRA TDD) measurement quantity | | P-CCPCH RSCP | |
| 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 | ell 1 | | | |
|--|------------------|--------------------------|-----------------------|--|--|--|
| | | T1 | T2 | | | |
| E-UTRA RF Channel Number | | 1 | | | | |
| BW _{channel} | MHz | 10 | | | | |
| OCNG Patterns defined in | | OR 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 1} | dB | | | | | |
| OCNG_RB ^{Note 1} | dB | | | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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 | | | | |
| Note 1: OCNG shall be used | such that both o | ells are fully allocated | and a constant | | | |
| total transmitted pow | | | | | | |
| Note 2: The resources for up | ink transmissior | are assigned to the I | JE prior to the start | | | |

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 | | | | |
|------------------------------|-------------|------------------|-------|-----|-------|--|
| | | T1 T2 | | | | |
| UTRA RF Channel number Note2 | | Channel 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 | -Infinity 5 | | 5 | | |
| PCCPCH RSCP Note1 | dBm | -Infinity | n.a. | -73 | n.a. | |
| lo Note1 | dBm/1.28MHz | -Infinity -70.88 | | | 0.88 | |
| loc | dBm/1.28MHz | -75 | | | | |
| Propagation condition | | AWGN | | | | |

PCCPCH RSCP and lo levels have been calculated from other parameters for Note 1: 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 | 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 | | | | | |
| $\hat{E}_{\scriptscriptstyle \mathrm{s}}/I_{\scriptscriptstyle \mathrm{ot}}$ | 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 | | AWGN | | | | |

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 | 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

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 |
| | | O II 4 | 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 | | 2,3,4,3,6,7, 6 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 | 7.5 Specifica III 10 50.155 clause 0.1.2.1. |
| Inter-RAT | | UTRA TDD PCCPCH RSCP | |
| measurement | | OTTO TEE TOOL OTT NOO! | |
| 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 | Unit Cell 1 | | | | |
|---------------------------------|----------------|-------------------------------|-------------------------|--|--|--|
| | | T1 T2 | | | | |
| E-UTRA RF Channel Number | | , | 1 | | | |
| BW _{channel} | | 5MHz: N | 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 | | (| 3 | | | |
| of cell 1 as specified in table | | | | | | |
| 4.2.1 in TS 36.211 | | | | | | |
| PDSCH parameters: DL | | 5MHz: F | R.4 TDD | | | |
| Reference Measurement | | 10MHz: | R.0 TDD | | | |
| Channel as specified in | | | | | | |
| clause A.3.1.1.2 | | | | | | |
| PCFICH/PDCCH/PHICH | | 5MHz: R | 11 TDD | | | |
| parameters: DL Reference | | | R.6 TDD | | | |
| Measurement Channel as | | | | | | |
| specified in clause A.3.1.2.2 | | | | | | |
| OCNG Pattern defined in | | 5MHz: O | P.9 TDD | | | |
| A.3.2.2.1 and A.3.2.2.9 | | | P.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 | | | | | |
| PDCCH_RB | dB | | | | | |
| PDSCH_RA | dB | | | | | |
| PDSCH_RB | dB | | | | | |
| OCNG_RA ^{Note 1} | dB | | | | | |
| OCNG RB ^{Note 1} | dB | | | | | |
| - | dBm/15 kHz | _C | 98 | | | |
| N_{oc} | UDITI/ TO KITZ | -5 | ,0 | | | |
| \hat{E}_s/N_{oc} | dB | 4 | 4 | | | |
| E_s/W_{oc} | | | | | | |
| $\hat{E}_{_s}/I_{_{ot}}$ Note 3 | dB | 4 | 4 | | | |
| L _s /L _{ot} | | | | | | |
| 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 | | | J70 | | | |
| Correlation Matrix and | | 1x2 Low | | | | |
| | | | - | | | |
| Antenna Configuration | | and fully allocated and a sou | | | | |

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 | DwPTS | 0 | DwPTS | 0 | DwPTS | 0 | DwPTS | 0 | DwPTS | 0 | DwPTS |
| UTRA RF | | Rai | ndomly 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 | | suc | h that cell | 2 is in the | ne normal | su | ch that cell | 3 is in th | ne reduced | su | ch that cell | 4 is in the | e reduced |
| (NOTE1) | | | perform | nance gr | oup | | perforn | nance gr | oup | | erformance | | |
| | | | | | | | | | | cł | nannel is di | fferent fro | om Cell 3 |
| | | | | | | | | | | | RF | channel. | |
| PCCPCH_Ec/lor | dB | -1 | nfinity | -3 | | | -Infinity | -3 | | | -Infinity | -3 | |
| DwPCH_Ec/lor | dB | -11 | nfinity | | 0 | | -Infinity | | 0 | | -Infinity | | 0 |
| OCNS_Ec/lor | | - | nfinity | -3 | | | -Infinity | -3 | | | -Infinity | -3 | |
| \hat{I}_{or}/I_{oc} | dB | -I | nfinity | 9 | | | -Infinity | 9 | | | -Infinity | 9 | |
| I_{oc} | dBm/1.28 MHz | | -70 | | | | -70 | | | | -70 | | |
| PCCPCH_RSCP | dB | -lı | nfinity | -64 | | | -Infinity | -64 | | , | -Infinity | -64 | |
| lo Note 3 | dBm/1.28 | -7 | 70.00 | - | | | -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 |
| Lhyatarasia | dB | 0 | event B1 |
| Hysteresis | | - | |
| TimeToTrigger | S | 0 | LO filtania a ia a at con al |
| 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 | Cell 1 | | | | |
|-----------------------------------|------------|-------------------------|-------------------------|--|--|--|
| | | T1 | T2 | | | |
| E-UTRA RF Channel Number | | 1 | | | | |
| BW _{channel} | | 5MHz: $N_{RB} = 25$ | | | | |
| | | 10MHz: N | I _{RB} = 50 | | | |
| PDSCH parameters: DL | | 5MHz: R | .5 FDD | | | |
| Reference Measurement | | 10MHz: F | R.0 FDD | | | |
| Channel as specified in | | | | | | |
| clause A.3.1.1.1 | | | | | | |
| PCFICH/PDCCH/PHICH | | 5MHz: R. | 11 FDD | | | |
| 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 | 1.15 FDD | | | |
| A.3.2.1.1 and A.3.2.1.15 | | 10MHz:OI | 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 | | | | |
| 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.8.7A.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 | 2 | T1 | | T2 | |
| Timeslot Number | | 0 DwPTS | 0 | DwPTS | 0 DwPTS | 0 | DwPTS | 0 DwPTS | 0 | DwPTS | |
| UTRA RF | | Randomly | selected 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 ce | ell 2 is in th | ne normal | such that ce | ell 3 is in the | reduced | such that cell | 4 is in the | e reduced | |
| (NOTE1) | | perfo | mance gr | oup | perfo | rmance grou | р | performance | | | |
| | | | | | | | | 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 (NOTE2) | | 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 (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 | |
| 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 | 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 | j | | | |
| 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 |
|------------------------------|------|------------------------------------|-----------|---|
| | | Value | | |
| PDSCH parameters (E- | | DL Reference Me | asurement | 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 |
| | | | | 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 | in. | | | 00140 : 50014 - 114 |
| 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 ARFCN 1 | | List of GSM cells provided before T2 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 FI | 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 | | | |

| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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 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 |
|--------------------------|----------------|--------------|------------------|
| Fleiu | Value | Value | |
| onDurationTimer | psf1 | psf1 | |
| drx-InactivityTimer | psf1 | psf1 | |
| drx-RetransmissionTimer | psf1 | psf1 | |
| longDRX-CycleStartOffset | sf40 | sf1280 | |
| shortDRX | Disable | Disable | |
| Note: For further | information se | e 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 |
|--------------------|--------|--------|-------------------------------|
| Fleid | Value | Value | |
| TimeAlignmentTimer | sf500 | sf500 | For further information see |
| TimeAlignmentTimer | \$1500 | \$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 |
| | | | 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 | 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 | 8 | | |
| RSRP | dBm/15 kHz | -94 | -94 | | |
| SCH_RP | dBm/15 kHz | -94 | -94 | | |
| Propagation Condition | | AWGN | | | |

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 | _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 | O | | |
| 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 | -94 | | |
| S-SCH_RP | dBm | -9 | 4 | |
| Propagation Condition | | ETU70 | | |
| Note 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 | | | | C | | |
|-----------------------|--------------|----------------|-----------|--------|-------|---|--|--|
| | | 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 | -Infinity | | | 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 | Unit | Се | II 1 | |
|--|-------------------|--------------------------|----------------|--|
| | | T1 | T2 | |
| E-UTRA RF Channel Number | | 1 | | |
| BW _{channel} | MHz | 1 | 0 | |
| OCNG Patterns defined in | | OP.1 | EDD | |
| 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 | 0 | | |
| PDCCH_RA | dB | | | |
| PDCCH_RB | dB | <u></u> | | |
| 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 | |
| $N_{oc}^{$ | 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 | | AW | GN | |
| Note 1: OCNG shall be used | such that both c | ells are fully allocated | and a constant | |
| total transmitted pow | er spectral densi | tv is achieved for all C | 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.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 (U | TRA 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 | | -} | 30 | |
| 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/lo and DwPCH_Ec/lo 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 | l | | |
| 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 | 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 | | |
| $N_{oc}^{$ | 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 | • | | |
| | hieved for all OF | | · | | |

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.8.10.1.1-3: 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 | |
| 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 | | |
|---|------|------------------------------------|------------|--|--|--|
| | | Value | | | | |
| PDSCH parameters (E- | | DL Reference Measurement | | 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 | | 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 | | No additional delays in random access procedure. | | |
| DRX | | 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 | 1 | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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 | | |
|--|---------|---------|---------|--|--|
| rieiu | 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.8.10.2.1-4: *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 | 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 | Cell | 2 | 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 | | _ | | | | |
| 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 | | | | | | |
| $N_{oc}^{ m Note 3}$ | 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 | |
| | be used suc | | | | ed and a co | nstant total transm | itted |

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.

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 | Cell 2 | | 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 | | | | | | |
| 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 | | | | | | |
| $N_{oc}^{ m Note 3}$ | dBm/15 kHz | -98 | | | | | |
| 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 | 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_{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 | | | |
| 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 | Се | II 2 | |
|--|------------|------|------|-----------|-------|--|
| | | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | , | 1 | 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 | | 2 | | | |
| 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 | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | 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 | 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 $^{N_{oc}}$ 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 (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.8.11.3.2 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 | Ce | II 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 | | DwPTS | | |
| | | T1 | T2 | T1 | T2 | |
| UTRA RF Channel | | | Char | nel 3 | | |
| Number* | | | | | | |
| PCCPCH_Ec/lor | dB | -3 | 3 | | | |
| DwPCH_Ec/lor | dB | | | 0 | | |
| OCNS_Ec/lor | dB | -3 | 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. | | |
| Propagation Condition | | Case 3 | | | | |
| Note1: The DDCH of all colleges located in a timeslet 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 (BW _{channel}) | MHz | 10 | |
| 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 | Се | II 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 | | | 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 | | | | | |
| $N_{oc}^{$ | 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 | |
| | OCNIC shall be used such that both calls are fully allocated and a constant total transmitted neuron anastral | | | | | |

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

| | | 00 | ell 1 | Cel | 1 4 | |
|--|------------|-------------|-------|-----------|-----|--|
| | | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | 1 | | 2 | | |
| Number | | | | | | |
| BW _{channel} | MHz | • | 0 | 10 |) | |
| Correlation Matrix and | | 1x2 | Low | 1x2 | Low | |
| Antenna Configuration | | | | | | |
| 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 | | |
| 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 | | | -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 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.

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

| Unit | Cell 1 | Cell 2 | Cell 3 | | |
|----------------|---------------------------------------|--|-----------|--|--|
| | 1 | 1 | 1 | | |
| | 1x2 Low | 1x2 Low | 1x2 Low | | |
| | OP.5 FDD | N/A | N/A | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| dB | 0 | N/A | N/A | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| dBm/ 15 kHz | | -95 | | | |
| dB | -Infinity | -Infinity | -Infinity | | |
| dBm/ 9 MHz | -67.22 | N/A | N/A | | |
| dB | 0 | -Infinity | -Infinity | | |
| | ETU30 | | | | |
| | dBm/ 15 kHz dB dBm/ 9 MHz | 1 1x2 Low OP.5 FDD dB 0 dBm/ 15 kHz dB -Infinity dBm/ 9 MHz -67.22 | 1 | | |

- 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 | Cell 3 | |
|---|----------------|--------|-----------|-----------|--------|--------|-----------|--|
| | | T2 | T3 | T2 | Т3 | T2 | T3 | |
| E-UTRA RF Channel | | | 1 | 1 | | | 1 | |
| Number | | | | | | | • | |
| Correlation Matrix and | | 1x2 | 2 Low | 1x2 | Low | 1x2 | Low | |
| Antenna Configuration | | | | | | | , | |
| OCNG patterns | | OP. | 5 FDD | OP.6 | FDD | OP.6 | N/A | |
| defined in A.3.2.1 | | | | 0.10 | | FDD | | |
| PBCH_RA | | | | | | | | |
| PBCH_RB | | | | | | | | |
| PSS_RA | | | | | | | | |
| SSS_RA | | | | | | | | |
| PCFICH_RB | | | _ | _ | | _ | | |
| PHICH_RA | dB | | 0 | C | 1 | 0 | N/A | |
| PHICH_RB | | | | | | | | |
| PDCCH_RA | | | | | | | | |
| PDCCH_RB | | | | | | | | |
| OCNG_RA ^{Note 1} | | | | | | | | |
| OCNG_RB ^{Note 1} | i. | | L 51/6 | . | 1 . | | | |
| PRS_RA | dB | -3 | N/A | N/A | 3 | 3 | N/A | |
| N_{oc} 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 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 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.8.12.1.2 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 | | OF IT TOD | 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/ | | O.F. | | | |
| $N_{oc}^{ m Note 3}$ | 15 kHz | | -95 | | | |
| PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$ | dB | -Infinity | -Infinity | -Infinity | | |
| | dBm/ | • | • | _ | | |
| lo Note 4 | 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 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.8.12.2.1-3: 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 ld | | 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 | | Į. | IN/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 | | OI .51 DD | 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 |
| oc | 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 | 01.22 | 14// (| 14// |
| $\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$ | dB | 0 | -Infinity | -Infinity |
| Propagation Condition | | | ETU30 | <u> </u> |

- 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 | Cell 1 | | Cell 2 | | Cell 3 | |
|---|----------------|--------|-----------|-----------|--------|----------|-----------|
| | | T2 | Т3 | T2 | T3 | T2 | T3 |
| E-UTRA RF Channel | | | 1 | 2 | | 2 | N/A |
| Number | | | - | | | | |
| Correlation Matrix and | | 1x2 | 2 Low | 1x2 l | Low | 1x2 | Low |
| Antenna Configuration | | | | | | | |
| OCNG patterns | | OP. | 5 FDD | OP.6 | FDD | OP.6 FDD | N/A |
| defined in A.3.2.1 | | _ | | | | | - |
| PBCH_RA | | | | | | | |
| PBCH_RB | | | | | | | |
| PSS_RA | | | | | | | |
| SSS_RA | | | | | | | |
| PCFICH_RB | | | | | | | |
| PHICH_RA | dB | | 0 | 0 | | 0 | N/A |
| PHICH_RB | | | | | | | |
| PDCCH_RA | | | | | | | |
| PDCCH_RB | | | | | | | |
| OCNG_RANote 1 | | | | | | | |
| OCNG_RB ^{Note 1} | | | T | | 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 | | | | 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_{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 $I_{\rm PRS}$ | | 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 |
| $\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$ | 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
- 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.8.13.2.1-3: Cell-specific test parameters for E-UTRAN TDD-TDD inter-frequency RSTD measurement reporting delay under fading propagation conditions

| Parameter | Unit | C | ell 1 | Cell 2 | | Cell 3 | |
|---|----------------|--------|-----------|-----------|--------|----------|-----------|
| | | T2 | T3 | T2 | T2 T3 | | Т3 |
| E-UTRA RF Channel | | | 1 | | 2 | | N/A |
| Number | | | | | | 2 | |
| Correlation Matrix and | | 1x2 | 2 Low | 1x2 | Low | 1x2 | Low |
| Antenna Configuration | | | | | | ļ., | |
| OCNG patterns | | OP. | 1 TDD | OP.2 | TDD | OP.2 TDD | N/A |
| defined in A.3.2.2 | | | | | | | |
| PBCH_RA | | | | | | | |
| PBCH_RB | | | | | | | |
| PSS_RA | | | | | | | |
| SSS_RA | | | | | | | |
| PCFICH_RB | | | _ | 0 | | 0 | N/A |
| PHICH_RA | dB | | 0 | | | | |
| PHICH_RB | | | | | | | |
| PDCCH_RA | | | | | | | |
| PDCCH_RB | | | | | | | |
| OCNG_RA ^{Note 1} | | | | | | | |
| OCNG_RB ^{Note 1} | -ID | 0 | NI/A | N1/A | | | NI/A |
| 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 | | | | 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 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 - an a sitia di 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 | Се | II 1 | Ce | Cell 2 | | |
|--|------------------------|--------------------|-----------------|----------------------|----------------|--|--|
| | | T1 | T2 | T1 | T2 | | |
| E-UTRA RF Channel | | , | 1 | | 2 | | |
| Number | | | | | | | |
| BW _{channel} | MHz | 1 | 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 | 2 FDD | | |
| (OP.1 TDD) 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 | | | | | | |
| $N_{_{oc}}^{}$ 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 -94 | | -91 | | |
| \hat{E}_s/N_{oc} | dB | 4 | 4 | -Infinity | 7 | | |
| Propagation Condition | | | | | | | |
| | e used such that bo | th cells are fully | allocated and a | a constant total tra | nsmitted power | | |
| | ty is achieved for all | | | | | | |
| Note 2: The resources for unlink transmission are assigned to the LIE prior to the start of time 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

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 |
|----------------------------|------|--------------------------|-----------|---|
| | | Val | lue | |
| Cell1 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 |
| Cell1PCFICH/PDCCH/PHIC | | DL Reference Me | asurement | 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 | asurement | 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 | <u> </u> | one FDD carrier frequencies is used. |
| Number | | | | |
| Channel Bandwidth | MHz | 1 | 0 | |
| (BW _{channel}) | | | | |
| Active cell | | Cell 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 | | 1 | | 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 | -(| 6 | |
| Hysteresis | dB | (| <u> </u> | |
| 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 ms | | Asynchronous cells |
| T1 | S | 5 | 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 | Ce | 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 | 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 | | | | | | | |

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 | Т3 | T1 | T2 | T3 | | |
| 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 |
|--|------|---|---|
| Cell 1 PDSCH parameters | | DL Reference Measurement 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

| E-UTRA RF Channel Number BW_channel SW_channel SW_chan | Parameter | Unit | Cell 1 Cell 2 | | | |
|---|---------------------------|-----------------------|-------------------|-----------------|----------------------|---------------|
| Number BW _{channel} MHz 10 10 Correlation Matrix and Antenna Configuration 1x2 Low 1x2 Low OCNG Pattern defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.2.2 (OP.2 TDD) OP.1 FDD OP.2 TDD PBCH_RA dB BBCH_RB BB | | Ī | T1 | T2 | T1 | T2 |
| BW channel | E-UTRA RF Channel | | 1 | | 2 | |
| Correlation Matrix and Antenna Configuration 1x2 Low | Number | | | | | |
| Antenna Configuration OCNG Pattern defined in A.3.2.1.1 (OP.1 FDD) FDD) and in A.3.2.2.2 (OP.2 TDD) PBCH_RA PBCH_RB PBCH_RB PSS_RA GB PCFICH_RB PHICH_RB PDCCH_RA PDCCH_RA PDCCH_RB PDCCH_RB PDSCH_RB GB PDSCH_RB GB POSCH_RB GCNG_RA GB POSCH_RB GCNG_RB OCNG_RB | | MHz | 10 |) | 10 |) |
| OCNG Pattern defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.2.2 (OP.2 TDD) OP.1 FDD OP.2 TDD FDD) and in A.3.2.2.2 (OP.2 TDD) OP.1 FDD OP.2 TDD PBCH_RA dB OP.1 FDD OP.2 TDD PBCH_RA 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 PSS_RA dB OP.2 TDD OP.2 TDD OCP.2 TDD OP.2 TDD OP.2 TDD OP.2 TDD OCP.2 TDD OP.2 TDD OP.2 TDD OP.2 TDD OCP.2 TDD OP.2 TDD OP.2 TDD OP.2 TDD | Correlation Matrix and | | 1x2 l | Low | 1x2 l | _OW |
| OP.1 FDD | Antenna Configuration | | | | | |
| FDD) and in A.3.2.2.2 (OP.2 TDD) PBCH_RA | | | | | | |
| (OP.2 TDD) PBCH_RA dB PBCH_RB dB PBCH_RB dB PSS_RA dB PSS_RA dB PSS_RA dB PCFICH_RB dB PHICH_RA dB PHICH_RB dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB OCNG_RB^Note 1 dB OCNG_RB^Note 1 dB DCNG_RB^Note 3 dBm/15 kHz -98 RSRP Note 4 dBm/15 kHz SCH_RP Note 4 dBm/15 kHz -94 -infinity -91 | | | OP.1 | FDD | OP.2 | TDD |
| PBCH_RA | | | | | | |
| PBCH_RB | (OP.2 TDD) | | | | | |
| PSS_RA | <u> </u> | V | | | | |
| SSS_RA | | V | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | PSS_RA | dB | | | | |
| PHICH_RA dB PHICH_RB dB PDCCH_RA dB PDCCH_RB dB PDSCH_RA dB PDSCH_RB dB PDSCH_RB dB PDSCH_RB dB PDSCH_RB dB PDSCH_RB dB PDSCH_RB dB POCNG_RB^Note 1 dB A 4 4 -Infinity 7 Note 3 dBm/15 kHz -94 -94 -Infinity -91 SCH_RP Note 4 dBm/15 kHz -94 -94 -infinity -91 | SSS_RA | dB | | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | PCFICH_RB | dB | | | 0 | |
| PDCCH_RA | PHICH_RA | dB | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | PHICH_RB | dB | 0 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | PDCCH_RA | dB | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | PDCCH_RB | dB | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | PDSCH_RA | dB | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | PDSCH_RB | dB | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | OCNG_RA ^{Note 1} | dB | | | | |
| $ \hat{E}_{s}/I_{ot} & dB & 4 & 4 & -Infinity & 7 \\ N_{oc} & N_{oc} & dBm/15 \text{ kHz} & -98 \\ \hline RSRP^{Note 4} & dBm/15 \text{ kHz} & -94 & -Infinity & -91 \\ \hline SCH_RP^{Note 4} & dBm/15 \text{ kHz} & -94 & -94 & -infinity & -91 \\ \hline \end{tabular} $ | OCNG_RB ^{Note 1} | dB | | | | |
| RSRP Note 4 dBm/15 kHz -94 -94 -Infinity -91 SCH_RP Note 4 dBm/15 kHz -94 -94 -infinity -91 | | dB | 4 | 4 | -Infinity | 7 |
| SCH_RP Note 4 dBm/15 kHz -94 -94 -infinity -91 | IV _{oc} | dBm/15 kHz | | | -98 | |
| | | dBm/15 kHz | -94 | -94 | -Infinity | -91 |
| \hat{E}/N dB 4 4 -Infinity 7 | SCH_RP Note 4 | dBm/15 kHz | -94 | -94 | -infinity | -91 |
| - s / · · oc | \hat{E}_s/N_{oc} | dB | 4 | 4 | -Infinity | 7 |
| Propagation Condition ETU70 | Propagation Condition | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power | | e used such that botl | h cells are fully | allocated and a | constant total trans | smitted 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.
RSRP and SCH_RP levels have been derived from other parameters for information purposes.

A.8.15.1.2 Test Requirements

Note 4:

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%.

They are not settable parameters themselves.

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 FDD | | UE may only be allocated at On Duration |
| Cell 1 | | DL Reference Me | | As specified in clause A.3.1.2.1. |
| PCFICH/PDCCH/PHICH | | Channel R.6 FDD |) | |
| 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 | | 1 | | 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 | -1 | | |
| 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 | | (| 3 | As specified in table 4.2-1 in TS 36.211 |
| configuration | | | | |
| Cell 2 Uplink-downlink | | 1 | | 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 | 3 | | Asynchronous cells |
| T1 | S | Ę | | |
| 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 | Се | II 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 | 1x | 2 Low | | |
| Antenna Configuration | | | | | | | |
| OCNG Patterns | | | | | | | |
| defined in A.3.2.1.1 | | OP.1 | FDD | OP | .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 | | , | 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 | -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 | | | 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 |
|-----------------------------------|-----------------|------------|---------|
| | 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 |
| Time, digriment time | 01000 | 31000 | clause 6.3.2 in TS 36.331. |
| or Configlinday | | 0 | For further information see |
| sr-ConfigIndex | 0 | | clause 6.3.2 in TS 36.331 and section10.1 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{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 | 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 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

| Parameter | | Unit | Value | Comment | | | | |
|--------------------|---|----------|---|---|--|--|--|--|
| PDSCH parameters | | | DL Reference Measurement | As specified in clause A.3.1.1.1 | | | | |
| | | | 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-UTRA RF Channel | | 1, 2 | Two radio channels are used for this test | | | | |
| | Number | | | Dimensional and DE sharped areas 4 | | | | |
| | e PCell | | Cell 1 | Primary cell on RF channel number 1. | | | | |
| SCel | Configured deactivated SCell | | Cell 2 | Configured deactivated secondary cell on RF channel number 2. | | | | |
| Neig | Neighbour cell | | Cell 3 | Neighbor cell to be identified on RF channel number 2. | | | | |
| Char | nnel Bandwidth | MHz | 10 | Channel bandwidth for cells on primary | | | | |
| (BW ₀ | channel) | | 10 | and secondary component carriers | | | | |
| CP le | 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 | Needs to take absolute accuracy tolerance | | | | |
| | | | -93 | 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 Cell-individual offset for cells dB | | 0 | | | | | |
| | Cell-individual offset for cells on RF channel number 1 | | 0 | Individual offset for cells on primary component carrier. | | | | |
| Cell- | Cell-individual offset for cells | | 0 | Individual offset for cells on secondary | | | | |
| | on RF channel number 2 | | 0 | component carrier. | | | | |
| | coefficient | | 0 | L3 filtering is not used | | | | |
| | SCell measurement cycle ms (measCycleSCell) | | 320 | | | | | |
| Cell2 | Cell2 timing offset to cell1 µs | | 0 | | | | | |
| | Time alignment error µs | | ≤ Time alignment error as | The value of time alignment error depends | | | | |
| | between cell2 and cell1 | | specified in TS 36.104 [30] clause 6.5.3.1. | upon the type of carrier aggregation. | | | | |
| Cell3 | 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 | T2 | | | UE shall report Event A6 within 6.4s | | | | |
| | | | ≤12 | (20xscellMeasCycle) | | | | |
| T3 | T3 s | | _ | UE shall report Event A2 within 200 ms | | | | |
| | | | 5 | and 1.6s for cells 1 and 2, respectively. | | | | |
| NOT | E: This test verifies the | e RRM re | equirement which is independent o | f 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.8.16.1.1-2: 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 | T3 |
| E-UTRA RF Channel | | 1 | | 2 | | 2 | | | | |
| Number | | 1 | | | | | | 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 | | | OP.2 FDD | | | |
| (OP.1 FDD) and in | | | | | | | | | | |
| A.3.2.1.2 (OP.2 FDD) | | | | | | | | | | |
| PBCH_RA | dB | | | | | | | | | |
| PBCH_RB | dB | 0 | | | 0 | | | 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 | | | | | | | | | |
| Noc 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 | | -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.8.16.1.2 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 $2 \times TTI_{DCCH}$ 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 | | |
| | CH/PDCCH/PHICH meters | | DL Reference Measurement Channel R.6 TDD | As specified in clause A.3.1.2.2 | | |
| E-UT | RA 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 | | | Configured deactivated secondary cell on | | |
| SCel | SCell | | Cell 2 | RF channel number 2. | | |
| Neig | Neighbour 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 | | |
| CP I | | | Normal | | | |
| Spec | ial subframe guration | | 6 | As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells. | | |
| Uplin | k-downlink guration | | 1 | guanor appres to an outer | | |
| DRX | | | OFF | Continuous monitoring of primary cell | | |
| A2 | Hysteresis | dB | 0 | Hysteresis for evaluation of event A2. | | |
| 7.2 | 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. | | |
| Cell- | ndividual offset for cells F channel number 2 | dB | 0 | Individual offset for cells on secondary component carrier. | | |
| | coefficient | | 0 | L3 filtering is not used | | |
| | I measurement cycle sCycleSCell) | ms | 320 | _ | | |
| | timing offset to cell1 | μs | 0 | | | |
| Time | alignment error een cell2 and cell1 | ror µs ≤ Time alignme | | 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. | | |
| NOT | F: This test verifies the | e RRM re | u equirement which is independent 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.8.16.2.1-2: 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 | T3 | T1 | T2 | Т3 | T1 | T2 | T3 | |
| E-UTRA RF Channel | | | 1 | | 2 | | | 2 | | | |
| Number | | · | | 2 | | | 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 | | | | 0 | | | 0 | | | |
| 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 | | -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 | | | | | | | | | | | |
| Note 1: OCNG shall b | e used such that | all cells a | re fully allo | cated and | d a constai | nt total tran | smitted p | ower spec | tral densi | ty 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.

RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable Note 3: 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× 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× 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.8.16.3 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 |
|----------------|--|-----------|---|---|
| PDS | CH parameters | | DL Reference Measurement Channel R.3 FDD | As specified in clause A.3.1.1.1 |
| | CH/PDCCH/PHICH meters | | DL Reference Measurement Channel R.6 FDD | As specified in clause A.3.1.2.1 |
| E-UT 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 SCel | igured deactivated I | | Cell 2 | Configured deactivated secondary cell on RF channel number 2. |
| Neighbour 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 |
| CP I | | | 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 | |
| | ndividual offset for cells F channel number 1 | dB | 0 | Individual offset for cells on primary component carrier. |
| on R | ndividual offset for cells F channel number 2 | dB | 0 | Individual offset for cells on secondary component carrier. |
| | coefficient | | 0 | L3 filtering is not used |
| | I 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 | ≤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 accordin 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 | Ce | 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 | | | | | | | |
| 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 | | | | -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_{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.8.16.3.2 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 |
|--------------------------|--|------|---|---|
| PDS | CH parameters | | DL Reference Measurement Channel R.0 TDD | As specified in clause A.3.1.1.2 |
| | CH/PDCCH/PHICH meters | | DL Reference Measurement Channel R.6 TDD | As specified in clause A.3.1.2.2 |
| E-UT Numl | RA RF Channel per | | 1, 2 | Two radio channels are used for this test |
| | e PCell | | Cell 1 | Primary cell on RF channel number 1. |
| SCell | | | Cell 2 | Configured deactivated secondary cell on RF channel number 2. |
| Neigh | nbour cell | | Cell 3 | Neighbor cell to be identified on RF channel number 2. |
| Chan (BW _c | nel Bandwidth _{hannel}) | MHz | 10 | Channel bandwidth for cells on primary and secondary component carriers |
| CP le | | | Normal | |
| 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. |
| | coefficient | | 0 | L3 filtering is not used |
| SCell | measurement cycle | ms | 1280 | |
| | timing offset to cell1 | μs | 0 | |
| Time | 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 | ≤30 | UE shall report Event A6 within 25.6s (20xscellMeasCycle) |

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 | Ce | II 1 | Ce | ell 2 | Ce | II 3 | |
|---------------------------|------------|-------|----------|------|-----------|-----------|-------|--|
| | | T1 | T2 | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | • | 1 | | 2 | 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 | |) | |
| 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 | 30 | Channel bandwidth for cells on primary | | | |
| (BW _{channel}) | | 20 | and secondary component carriers | | | |
| A2 Threshold RSRP | dBm | | Actual RSRP threshold for event A2. | | | |
| | | -96 | Needs to take absolute accuracy tolerance | | | |
| | | -90 | 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) | | 0 | P.11 FDI |) | , | OP.12 FD | D | 0 | P.12 FDD | | | |
| N _{oc} Note 2 | dBm/15 kHz | | -104 | | | | -1 | 04 | | | | |
| 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 | -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 | meter | Unit | Value | Comment | | |
|--------------------------|-------------------|------|--------------------------|---|--|--|
| PDSCH paran | neters | | DL Reference Measurement | As specified in section A.3.1.1.2 | | |
| | | | Channel R.3 TDD | | | |
| PCFICH/PDCCH/PHICH | | | DL Reference Measurement | As specified in section A.3.1.2.2 | | |
| parameters | | | Channel R.10 TDD | | | |
| Channel Band | Channel Bandwidth | | 20 | Channel bandwidth for cells on primary | | |
| (BW _{channel}) | | | 20 | and secondary component carriers | | |
| A2 | Threshold | dBm | | Actual RSRP threshold for event A2. | | |
| | RSRP | | -96 | Needs to take absolute accuracy tolerance | | |
| | | | -90 | 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 |) | OI | P.8 TDD | |
| defined in | | | | | | | | | | |
| A.3.2.2.7 | | | | | | | | | | |
| (OP.7 TDD) | | | | | | | | | | |
| and in | | | | | | | | | | |
| A.3.2.2.8 | | | | | | | | | | |
| (OP.8 TDD) | | | | | | | | | | |
| Noc Note 2 | dBm/15 kHz | | -104 | | | | -1 | 04 | | |
| 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 | 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 o | ther general test parameters. | | | | | | | |
| Note 2: This test verifies the | · · | | | | | | | | |
| to the principle defi | 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

| Parameter | Unit | Ce | ell 1 | Ce | ell 2 | Cel | I 3 | |
|--|------------------|-------------|---------------|-----------|-------|-----------|-------|--|
| | | T1 | T2 | T1 | T2 | T1 | T2 | |
| BW _{channel} | MHz | 2 | 20 | 2 | 20 | 20 | | |
| OCNG Patterns defined in A.3.2.1.17 (OP.17 FDD) and in A.3.2.1.12 (OP.12 FDD) | | OP.1 | 7 FDD | OP.1 | 2 FDD | OP.12 FDD | | |
| $N_{oc}^{ m Note 3}$ | 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. | 16.3.1-2 for oth | er cell-spe | cific test pa | arameters | | | • | |

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 | II 1 | 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 TDD | | OP.8 TDD | | | | |
| $N_{oc}^{$ | dBm/15 kHz | -1 | 01 | | -1 | 01 | | |
| 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 | | ı | 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 | | OP.16 FDD | | OP.16 FDD | |) | |
| (OP.1 FDD) and in | | | | | | | | | | |
| A.3.2.1.16 (OP.16 | | | | | | | | | | |
| FDD) | | | | | | | | | | |
| Note 1: See Table A.8.16 | 6.1.1-2 for the | other spe | ecific para | meters | 3. | | | | | |

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 |

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 | T3 | 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 TDD |) | 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 | .16.2.1-2 for | the othe | r specific | paramet | ers. | | | | | |

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 | Cell 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.1 | P.10 FDD | | 6 FDD | OP.16 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 | Cell 1 | | C | ell 2 | Cell 3 | | | |
|---|------|--------------------|-------|---|-------|--------|-----|--|--|
| | | T1 | T1 T2 | | T1 T2 | | 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 Channel R.5 FDD | 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 component carrier |
| Channel Bandwidth (BW _{channel}) | MHz | 5 | Channel bandwidth for cells on secondary 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 FDI |) | OP.16 FDD | | | OP.16 FDD | | |
| (OP.15.FDD) and in | | | | | | | | | | |
| A.3.2.1.16 (OP.16 | | | | | | | | | | |
| FDD) | | | | | | | | | | |
| Note: See Table A. | .8.16.1.1-2 for o | other cell- | specific t | 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 | 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 | | OP.10 TDD | | OP10 TDD | |) | |
| (OP.9 TDD) and in | | | | | | | | | | |
| A.3.2.2.10 (OP.10 | | | | | | | | | | |
| TDD) | | | | | | | | | | |
| 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 | Cell 1 | | Cell 2 Ce | | Cel | I 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 FDD | | OD 1 | 6 FDD | OP.16 | EDD | | | | | | | | |
| FDD) and in A.3.2.1.16 | | OP.20 FDD | | UP.1 | 6 FDD | OP.16 | רטט | | | | | | | | |
| (OP.16 FDD) | | | | | | | | | | | | | | | |
| Note: See Table A.8.1 | 6.3.1-2 for oth | er cell-spe | cific test pa | arameters | S. | | | | | | | | | | |

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 | Cell 1 | | Cell 2 | | Cell 3 | | |
|-----------------------------|---|----------|--|-----------|--|--------|-----|--|
| | | T1 T2 | | T1 T2 | | T1 | T2 | |
| BW _{channel} | MHz | 5 | | 5 | | 5 | | |
| OCNG Patterns defined in | | | | | | | | |
| A.3.2.2.9 (OP.9 TDD) and in | | OP.9 TDD | | OP.10 TDD | | OP.10 | TDD | |
| A.3.2.2.10 (OP.10 TDD) | | | | | | | | |
| Note: See Table A.8.16.4 | e 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, 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. |

te: 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 | | | ı | | | 2 | |
| 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 | | | | 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} 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 -8 | | |
| Ê _s /N _{oc} | dB | | 17 | | | 17 | |
| Propagation Condition | | | | | 'GN | | |
| | e used such that | | | | d a constai | nt total tran | smitted |
| | al density is achie | | | | | | |
| Note 2: Interference f | rom other cells a | nd noise s | ources not | specified | l in the test | is assume | d to be |

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.8.16.17.2 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

991

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 | | DL Reference Measurement | As specified in section A.3.1.2.1 |
| parameters | | Channel R.10 FDD | 7 to opening in section 7 iii 1 i 2 i 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 | | | 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 | Т3 | | |
| BW _{channel} | MHz | 10 | | | 5 | | | |
| OCNG Patterns | | | | | | | | |
| defined in A.3.2.1.11 | | | P.10 FDD | | | 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 | | C | P.20 FDD | | C | P.16.FDD | |
| (OP.15 FDD) and in | | | | | | | |
| A.3.2.1.16 (OP.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, 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 T1 T2 T3 | | | | Cell 2 | |
|---------------------------------|------------------|-----------------|---------------|-----------|-------------|----------------|---------|
| | | | | | T1 | T2 | Т3 |
| E-UTRA RF Channel | | | 1 | | | 2 | |
| Number | | | | | | | |
| 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 | | | | | | |
| N _{oc} 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 | | | | | 'GN | | |
| Note 1: OCNG shall b | e used such that | all cells a | re fully allo | cated and | d a constar | nt total trans | smitted |

- 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.8.16.18.2 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 | T3 | T1 | T2 | T3 |
| BW _{channel} | MHz | 10 | | | 5 | | |
| OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.10 (OP.10 TDD) | | | OP.1 TDD | | C | P.10.TDD | |

A.8.16.18B.2 Test 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 | | | 01.0125 | | | | | | |
| 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, 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 | | | hannel 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 | | | Cell 2 | | |
|---------------------------|------|--------|----------|----|--------|----------|----|
| | | T1 | T2 | Т3 | T1 | T2 | Т3 |
| E-UTRA RF Channel | | | 1 | | | 2 | |
| Number | | | ı | | | | |
| 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 | | 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 | -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 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.8.16.19.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell (m+9), 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 | Т3 | T1 | T2 | T3 |
| BW _{channel} | MHz | | 20 | | 20 | | |
| OCNG Patterns | | | | | | | |
| defined in A.3.2.1.17 | | OP.17 FDD | | | OP.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 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 (Cell 1) DL Reference Measurement Channel R.11 FDD (Cell 2) | As specified in section A.3.1.2.1 |

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 | T3 | |
| BW _{channel} | MHz | 10 | | | 5 | | | |
| OCNG Patterns | | | | | | | | |
| defined in A.3.2.1.11 | | OP.10 FDD | | | OP.16.FDD | | | |
| (OP.11 FDD) and in | | | | | | | | |
| 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

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| 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 | Т3 | T1 | T2 | T3 | |
| BW _{channel} | MHz | 5 | | | 5 | | | |
| OCNG Patterns | | | | | | | | |
| defined in A.3.2.1.15 | | OP.20 FDD | | | OP.16.FDD | | | |
| (OP.15 FDD) and in | | 325 . 22 | | | | | | |
| 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

| | 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. |
| T3 | s | 1 | During this time the UE shall deactivate |

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 T3 | | T1 | T2 | Т3 | |
| E-UTRA RF Channel | | | 1 | | 2 | | |
| Number | | | 1 | | | | |
| 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 | 7 |
| 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 | | 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 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 | Т3 | T1 | T2 | Т3 | |
| 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.8.16.20A.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 | parameters DL Reference Measurement | | As appointed in acction A 2.1.1.2 |
| | | Channel R.0 TDD | As specified in section A.3.1.1.2 |
| 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. r.z.z |
| | | 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 | Т3 | T1 | T1 T2 | | |
| 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.8.16.20C.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 | 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.8.16.20D.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 arriers | | DL Reference Measurement Channel R.10 TDD | As specified in section A.3.1.2.2 |
| on se | Channel bandwidth for cells on secondary carriers (BW _{channel}) | | 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 |
| 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 | 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. |
| | 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 | | | OP.2 TDD | | | |
| (OP.7 TDD) and in | | | | | | | | | | |
| A.3.2.2.2 (OP.2 TDD) | | | | | | | | | | |
| 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 | 19.00 | -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 | 3. | | | | | |

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 | Cell 1 | | С | Cell 2 | | Cell 3 | |
|----------------------------------|-----------------|------------|---------------|----------|--------|------|--------|--|
| | | T1 | T2 | T1 | T2 | T1 | T2 | |
| BW _{channel} | MHz | 20 | | 10 | | 10 | | |
| OCNG Patterns defined in A.3.2.2 | | OP. | 7 TDD | OP. | 2 TDD | OP.2 | TDD | |
| Note: See Table A.8.1 | 6.4.1-2 for oth | er cell-sp | ecific test p | arameter | S. | | | |

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 | | | |
| | | | | 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 | | | |
| | | | 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 | T3 | T1 | T2 | T3 | T1 | T2 | T3 | |
| E-UTRA RF Channel Number | | | 1 | | | | 2 | | | | |
| BW _{channel} | | 5M | 1Hz: N _{RB,c} = | 25 | | | 5MHz: N _{RE} | | | | |
| | | | ИHz: N _{RB,c} = | | | | 10MHz: N _R | | | | |
| DD 0 0 1 1 | | | 1Hz: N _{RB,c} = | | | | ,c = 100 | | | | |
| PDSCH | | | MHz: R.5 F[| | | | | | | | |
| parameters: DL Reference | | | MHz: R.0 F MHz: R.4 F | | | _ | | | _ | | |
| Measurement | | 201 | IVII 12. TX. T T | | | | | | _ | | |
| Channel | | | | | | | | | | | |
| PCFICH/PDCCH/ | | 5M | 1Hz: R.11 F | DD | 5N | /lHz: R.11 T | DD | 5MH | z: R.11 T | DD | |
| PHICH | | 10 | MHz: R.6 F | DD | 10 | MHz: R.6 T | DD | 10M | Hz: R.6 T | DD | |
| parameters: | | 201 | ИHz: R.10 F | DD | 201 | MHz: R.10 T | TDD | 20MF | dz: R.10 | ΓDD | |
| DL Reference | | | | | | | | | | | |
| Measurement | | | | | | | | | | | |
| Channel | | C N 41 | I OD 45 F | -00 | 5MHz: OP.10 TDD 5MHz: OP.10 TDD | | | | | | |
| OCNG Patterns defined | | | Hz: OP.15 F //Hz: OP.1 F | | | нz: ОР.10 ИНz: ОР.2 1 | | | z: OP.10 lz: OP.2 ⁻ | | |
| delined | | | | | | | | | 12. OP.2 1z: OP.8 | | |
| PBCH RA | dB | 20101 | 20MHz: OP.11 FDD 20MHz: OP.8 TDD | | | | | | 12. 01 .0 | וטט | |
| 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} OCNG_RB ^{Note 1} | dB | | | | | | | | | | |
| N _{oc} ^{Note 2} | dB dBm/15 | | -104 | | | | -104 | 1 | | | |
| IN _{OC} | kHz | | -104 | | | | -102 | ł | | | |
| 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 kHz | -87 | -87 | -107 | -87 | -87 | -107 | -infinity | -87 | -107 | |
| lo Note 3 | dBm/Ch | -59.13 | -59.13 | -74.45 | -59.17 | -56.13 | -73.20 | | l . | I | |
| | 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 error relative to | μs | - | | | ≤ TAE | | | N/A | | | |
| cell 1 Note 5 | | | | | | | | l power spe | | | |

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 | Unit | | Cell 1 | | | Cell 2 | | | Cell 3 | | |
|---------------------------------|-------------|--------------------|--------------------------|--------------------|--------------------|--------------------|------------------------|------------------------------------|------------------------|---------|--|
| | | T1 | T2 | T3 | T1 | T2 | T3 | T1 | T2 | Т3 | |
| E-UTRA RF Channel Number | | | 1 | | | | 2 | | | | |
| BW _{channel} | | 5M | IHz: N _{RB,c} = | 25 | | | 5MHz: N _{RE} | _{B,c} = 25 | | | |
| | | | ИHz: N _{RB,c} = | | | | 10MHz: N _R | $_{\rm B,c} = 50$ | | | |
| | | | IHz: N _{RB,c} = | | | | 20MHz: N _{RE} | _{3,c} = 100 | | | |
| PDSCH | | | ЛHz: R.4 TI | | | | | | | | |
| parameters: | | | MHz: R.0 T | | | | | | | | |
| DL Reference | | 201 | MHz: R.3 T | DD | | - | | | - | | |
| Measurement | | | | | | | | | | | |
| Channel | | | | | | | | | | | |
| PCFICH/PDCCH/ | | | IHz: R.11 T | | | 1Hz: R.11 F | | | z: R.11 F | | |
| PHICH | | | MHz: R.6 T | | | MHz: R.6 F | | | Hz: R.6 F | | |
| parameters: | | 201 | //Hz: R.10 Т | טט | 201 | ИHz: R.10 F | שט | 20MF | dz: R.10 F | -טט | |
| DL Reference | | | | | | | | | | | |
| Measurement | | | | | | | | | | | |
| Channel CONC Batterns | | C N A | III OD 0 T | .DD | C N 4 | U=: OD 40 F | -DD | C N AL I | OD 40.1 | | |
| OCNG Patterns | | | Hz: OP.9 T | | | Hz: OP.16 F | | 5MHz: OP.16 FDD 10MHz: OP.2 FDD | | | |
| defined | | | //Hz: OP.1 1 | | | | | | 12: OP.2 i z: OP.12 | | |
| PBCH_RA | dB | ∠UI\ | //Hz: OP.7 | טטו | ZUIV | II IZ. UP. IZ | טט | ZUIVIH | Z. UP. 12 | רטט | |
| PBCH_RB | dB | | | | | | | | | | |
| PSS_RA | dB | | | | | | | | | | |
| SSS_RA | dB | | | | | | | | | | |
| PCFICH_RB | dB | | | | | | | | | | |
| PHICH_RA | dB | | | | | | | | | | |
| PHICH_RB | dB | | 0 | | | 0 | | | 0 | | |
| PDCCH_RA | dB | | U | | | U | | | U | | |
| PDCCH_RB | dB | | | | | | | | | | |
| PDSCH_RA | dB | | | | | | | | | | |
| PDSCH_RB | dB dB | | | | | | | | | | |
| OCNG_RA ^{Note 1} | dB | | | | | | | | | | |
| OCNG_RB ^{Note 1} | dB | | | | | | | | | | |
| Noc Note 2 | dBm/15 | | -104 | | | | -104 | 1 | | | |
| INOC | kHz | | -104 | | | | -10- | Ŧ | | | |
| 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 | -87 | -87 | -107 | -87 | -87 | -107 | -infinity | -87 | | |
| | kHz | 0. | 0. | | | | | | | -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 | | | AWGN | | | ETU70 | | | ETU70 | | |
| Condition | | | | | | | | | | | |
| 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 | | |
| cell 1 Note 5 | hall be use | d such that | all colle aro | fully allocat | ted and a co | onstant total | transmittor | l nower spo | ctral dens | eity ie | |

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 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.

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.

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 $2 \times TTIDCCH$ 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 | 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 SCell | | | Cell 2 | Configured deactivated secondary cell on RF channel number 2. |
| Neigl | Neighbour 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.8.16.25.1-2: 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 | Cell 3 | | | |
|---|------|-------------------|--|---|---|---|----------------------------------|--|--|
| | | T1 | T2 | T1 | T2 | T1 | T2 | | |
| E-UTRA RF Channel Number | | | 1 | | 2 | | | | |
| BW _{channel} | | 10MHz: I | $I_{RB,c} = 25$ $I_{RB,c} = 50$ $I_{RB,c} = 100$ | | 5 MHz: $N_{RB,c} = 25$ 10 MHz: $N_{RB,c} = 50$ 20 MHz: $N_{RB,c} = 100$ | | | | |
| 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 | | 10MHz: | 11 FDD R.6 FDD 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 | | | |
| OCNG Patterns defined | | 10MHz: C | P.20 FDD P.10 FDD P.17 FDD | 10MHz: 0 | 5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD | | P.10 TDD OP.2 TDD OP.8 TDD | | |
| PBCH_RA | dB | | | | | | | | |
| PBCH_RB | dB | | | | | | | | |
| PSS_RA | dB | | | | | | | | |
| SSS_RA | dB | | 0 | | 1 | 0 | | | |
| 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} 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 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 Ce | | |
| Propagation Condition | | | 'GN | | GN | 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.8.16.25.2 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. |
| Configured deactivated SCell | | | Cell 2 | Configured deactivated secondary cell on RF channel number 2. |
| Neigl | Neighbour 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} | | 5MHz: N 10MHz: N 20MHz: N | B,c = 25 RB,c = 50 B,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 | | |
| PCFICH_RB | dB | | , | U | | | | |
| 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 Cel | |
| 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 | igured deactivated SCell | | Cell 2 | Configured deactivated secondary cell on RF |
| Con | igured deactivated Scell | | Cell 2 | channel number 2. |
| Conf | igured deactivated SCell | | Cell 3 | Configured deactivated secondary cell on RF |
| Con | igured deactivated Scell | | Cell 3 | channel number 3. |
| Neia | hbour cell | | Cell 4 | Neighbour cell to be identified on RF channel |
| | | | | number 3. |
| | ength | | Normal | |
| DRX | | | OFF | Continuous monitoring of primary cell |
| _ | | | • | As specified in table 4.2-1 in TS 36.211. The |
| Spec | cial subframe configuration | | 6 | same configuration applies to all TDD cells |
| | | | | (cell2, cell3 and cell4). |
| منا ما ا | le decombine e entire metion | | 4 | As specified in table 4.2-2 in TS 36.211. The |
| Upiir | k-downlink configuration | | 1 | same configuration applies to all TDD cells |
| | Lluotarasia | dB | 0 | (cell2, cell3 and cell4). |
| | Hysteresis | иь | U | Hysteresis for evaluation of event A1. Actual RSRP threshold for event A1. Needs to |
| A1 | Threshold RSRP | dBm | -98 | |
| Αī | Tilleshold KSKP | ubili | -90 | take absolute accuracy tolerance in section 9.1.11.1 into account plus margin. |
| | Time To Triager | | ^ | 9.1.11.1 into account plus margin. |
| | Time To Trigger | s dB | 0 0 | Livetaragia for evaluation of event A2 |
| | Hysteresis | иь | U | Hysteresis for evaluation of event A2. Actual RSRP threshold for event A2. Needs to |
| ۸.۵ | Throphold DCDD | dBm | 00 | |
| A2 | Threshold RSRP | ubili | -98 | take absolute accuracy tolerance in section 9.1.11.1 into account plus margin. |
| | Time To Trigger | | ^ | 9.1.11.1 into account plus margin. |
| | Hysteresis | s dB | 0 | Hysteresis for evaluation of event A6. |
| | Trysteresis | uБ | U | Offset parameter for evaluation of event A6. |
| | Offset | dB | -6 | Needs to take relative accuracy tolerance in |
| A6 | Oliset | ub | -0 | section 9.1.11.2 into account plus margin. |
| | Report on leave | | False | Section 9.1.11.2 into account plus margin. |
| | Time To Trigger | S | 0 | |
| Cell- | individual offset for cells on | | | Individual offset for cells on primary component |
| | hannel number 1 | dB | 0 | carrier. |
| | individual offset for cells on | | | Individual offset for cells on secondary |
| | hannel number 2 | dB | 0 | component carrier. |
| | individual offset for cells on | | | Individual offset for cells on secondary |
| | hannel number 3 | dB | 0 | component carrier. |
| | coefficient | | 0 | L3 filtering is not used |
| | I measurement cycle | | | |
| | sCycleSCell) | ms | 320 | |
| , | , | | | 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. |
| | | | -40 | UE should report Event A1 for cell2 and event |
| TO | | S | ≤12 | |
| T2 | | | | A6 for cell4 within 6.4s (20xscellivleasCycle) |
| T2 T3 | | s | 5 | A6 for cell4 within 6.4s (20xscellMeasCycle) UE should report Event A2 within 200 ms. 1.6s, |

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 | | | ИHz: R.0 F | | | | | | | | | | | |
| Measurement | | 201 | ИHz: R.4 F | -טט | | | | | | | | | | |
| 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 | 5ME | lz: OP.10 | TDD | |
| oono i allomo | | | Hz: OP.1 | | | Hz: OP.2 | | | Hz: OP.2 | | | Hz: OP.2 | | |
| | | | Hz: OP.11 | | | Hz: OP.8 | | 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 | -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 | 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 | | | | nns tor | | | |
| | | (N _{RB,c} /50) | (N _{RB,c} /50) | (N _{RB,c} /50) | (N _{RB,c} /50) | (N _{RB,c} /50) | (N _{RB,c} /50) | | | | | | | |
| Propagation Condition | | 730) | AWGN | 730) | /30) | ETU70 | 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 |

- 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.8.16.27.2 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-U1 | RA RF Channel Number | | 1, 2, 3 | Three radio channels are used for this test |
| Activ | re PCell | | Cell 1 | Primary cell on RF channel number 1. |
| Conf | igured deactivated SCell | | Cell 2 | Configured deactivated secondary cell on |
| | | | | RF channel number 2. |
| Conf | igured deactivated SCell | | Cell 3 | Configured deactivated secondary cell on |
| | | | | RF channel number 3. |
| Neig | hbour 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 |
| A1 | Llyotoropio | dB | 0 | cell (cell1). Hysteresis for evaluation of event A1. |
| AI | Hysteresis Threshold RSRP | dВm | 0 -98 | Actual RSRP threshold for event A1. |
| | Threshold RSRP | ubili | -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. |
| | Throshold North | abiii | 00 | Needs to take absolute accuracy tolerance |
| | | | | in section 9.1.11.1 into account plus |
| | | | | margin. |
| | Time To Trigger | S | 0 | Ĭ |
| 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 | 0 | |
| | individual offset for cells on | dB | 0 | Individual offset for cells on primary |
| | hannel number 1 | | | component carrier. |
| | individual offset for cells on | dB | 0 | Individual offset for cells on secondary |
| | hannel number 2 | in. | | component carrier. |
| | individual offset for cells on | dB | 0 | Individual offset for cells on secondary |
| | hannel number 3 | | • | component carrier. |
| | r coefficient | | 0 | L3 filtering is not used |
| | Il measurement cycle | ms | 320 | |
| T1 | asCycleSCell) | | 5 | During this time the cell1 and cell3 shall be |
| 11 | | S | 5 | known to the UE; but cell2 and cell 4 shall |
| | | | | be unknown to the UE. |
| T2 | | | ≤12 | UE should report Event A1 for cell2 and |
| 12 | | S | 21∠ | event A6 for cell4 within 6.4s |
| | | | | (20×scellMeasCycle) |
| T3 | | S | 5 | UE should report Event A2 within 200 ms. |
| 13 | | 3 | 3 | 1.6s, and 1.6s for cells 1, 2 and 3, |
| | | | | |
| | | | | 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 | • | | • | | 3 | I | | | |
| BW _{channel} | | 5MI | Hz: N _{RB,c} = | = 25 | 5MI | Hz: N _{RB,c} = | = 25 | | 5MHz: | | | N _{RB,c} = 25 | | | |
| | | | IHz: 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: | | | IHz: R.4 T | | | - | | | - | | | - | | | |
| DL Reference | | | /Hz: R.0 T | | | | | | | | | | | | |
| Measurement | | 201 | //Hz: R.3 Т | טט | | | | | | | | | | | |
| Channel PCFICH/PDCCH/PHI | | C N 41 | II D 44 T | | 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 Т ИНz: R.6 Т | | | Hz: R.11 F //Hz: R.6 F | | | Hz: R.11 F ИHz: R.6 F | | | Hz: R.11 F ИHz: R.6 F | | | |
| DL Reference | | | //m2. K.6 / IHz: R.10 | | | /IПZ. К.6 г IHz: R.10 | | | ипz. к.о г 1Hz: R.10 | | | /IПZ. К.б г IHz: R.10 | | | |
| Measurement | | 2010 | II IZ. K. IU | טטו | 2010 | II IZ. K. IU | гоо | 2010 | II IZ. K. IU | רטט | 2010 | II IZ. K. IU I | טט | | |
| Channel | | | | | | | | | | | | | | | |
| OCNG Patterns | | 5MI | Hz: OP.9 T | ΓDD | 5ML | Iz: OP.16 | FDD | 5MF | lz: OP.16 | FDD | 5ME | lz: OP.16 | FDD | | |
| oono i allome | | | Hz: OP.1 | | | Hz: OP.2 | | | Hz: OP.2 | | | Hz: OP.2 | | | |
| | | | Hz: OP.7 | | | Hz: OP.12 | | | Hz: OP.12 | | 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 | | | 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 | 1 | | -104 | 1 | -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 | | |
| 10 1000 | dBm/Ch BW | -59.13 | -59.13 | -74.45 | -76.22 | -59.13 | -74.45 | -59.13 -56.17 -73.20 | | Specified in columns for | | , | | | |
| | | +10log | +10log | +10log | +10log | +10log | +10log | | | Specifi | | nns tor | | | |
| | | (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) | /30) | ETU70 | 730) | ETU70 ETU70 | | | | | | | |
| Correlation Matrix and | | | 1x2 | | | 1x2 Low | | 1x2 Low 1x2 Low | | | | | | | |
| Antenna Configuration | | | | | | | | | LOW | | | LOW | | | |

| 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.8.16.28.2 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 |
|-------------|--|------|------------------|---|
| E-UT Num | RA RF Channel | | 1, 2, 3 | Three radio channels are used for this test |
| | e PCell | | Cell 1 | Primary cell on RF channel number 1. |
| | gured deactivated | | | Configured deactivated secondary cell 1 |
| SCel | | | Cell 2 (SCell 1) | on RF channel number 2. |
| | | | Call 2 (SCall 2) | Configured deactivated secondary cell 2 |
| | | | Cell 3 (SCell 2) | on RF channel number 3. |
| Neigl | nbour cell | | Cell 4 | Neighbor cell to be identified on RF channel number 3. |
| CP le | ength | | 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 | <u> </u> |
| 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} : | | | | 10MHz: I | | | | | |
| | | | Hz: N _{RB,c} = | | 20M | Hz: N _{RB,c} = | : 100 | | | 20MHz: N | N _{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.11 | | | Hz: OP.12 | | 10MHz: OP.2 FDD 20MHz: OP.12 FDD | | | 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 | -87 | -87 | -107 | -infinity | -87 | -107 | | | | -infinity | -87 | -107 | | |
| lo Note 3 | 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 | | | | mns for | | | | |
| | | (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) /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 | 1 | 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 |
| Numl | | | | |
| | e PCell | | Cell 1 | Primary cell on RF channel number 1. |
| Confi 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. |
| Neigh | nbour cell | | Cell 4 | Neighbor cell to be identified on RF channel number 3. |
| CP le | enath | | Normal | Griatifier Hamber 6. |
| 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 channel number 1 | dB | 0 | Individual offset for cells on primary component carrier. |
| Cell-i | ndividual offset for cells channel number 2 | dB | 0 | Individual offset for cells on secondary component carrier 1. |
| Cell-i | ndividual offset for cells 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 | | | 5 | During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4. |
| T2 | T2 | | ≤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} = | | | | | I _{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 | | | 1z: R.11 1 | | |
| 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 | | 10MHz: OP.2 TDD | | | 10MHz: OP.2 TDD | | | |
| | | 20MI | Hz: OP.11 | טטו | 20MI | Hz: OP.12 | טטו | 20MHz: OP.12 TDD | | | 20MF | lz: OP.12 | טטו | |
| 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 | -59.13 | -56.17 | -73.20 | | | | |
| | | +10log | +10log | +10log | +10log | +10log | +10log | +10log | +10log | +10log | Specifi | ed in colu | mns for | |
| | | $(N_{RB,c}$ | (N _{RB,c} | $(N_{RB,c}$ | $(N_{RB,c}$ | (N _{RB,c} | $(N_{RB,c}$ | (N _{RB,c} | (N _{RB,c} | $(N_{RB,c}$ | | 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 0 0 | three radio channels are used for this test | | | | | | |
| Num | ber | | 1, 2, 3 | | | | | | | |
| Activ | e PCell | | Cell 1 | Primary cell on RF channel number 1. | | | | | | |
| Conf | igured deactivated | | Cell 2 | Configured deactivated secondary cell or | | | | | | |
| SCel | | | Cell 2 | RF channel number 2. | | | | | | |
| | igured deactivated | | Cell 3 | Configured deactivated secondary cell on | | | | | | |
| SCel | | | Och 5 | RF channel number 3. | | | | | | |
| Neig | hbour cell | | Cell 4 | Neighbor cell to be identified on RF | | | | | | |
| | | | | channel number 3. | | | | | | |
| | 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 | | | | | | |
| 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 | | | | | | | |
| | individual offset for cells | dB | 0 | Individual offset for cells on primary | | | | | | |
| | F channel number 1 | ın | - | component carrier. | | | | | | |
| | individual offset for cells | dB | 0 | Individual offset for cells on secondary | | | | | | |
| | F channel number 2 | <u> </u> | | component carrier. | | | | | | |
| | individual offset for cells | dB | 0 | Individual offset for cells on secondary | | | | | | |
| | F channel number 3 | | 0 | component carrier. | | | | | | |
| | coefficient | | 0 | L3 filtering is not used | | | | | | |
| | I measurement cycle | ms | 1280 | During this times the LIE shall be successful. | | | | | | |
| T1 | | S | 5 | During this time the UE shall be aware of | | | | | | |
| T2 | | • | | cells 1, 2 and 3 but not cell 4. | | | | | | |
| 12 | | S | ≤30 | UE should report Event A6 within 25.6s | | | | | | |
| Т | | | 1 | (20xscellMeasCycle) | | | | | | |
| T3 T4 | | S | 1 | During this time the UE shall activate cell 2 | | | | | | |
| 14 | | 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 | | | | | T2 | T3 | T4 | T1 | T2 | Т3 | 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: | $N_{RB,c} = 25$ $N_{RB,c} = 50$ $N_{RB,c} = 100$ | | 5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{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/A | | | | |
| 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 | | 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: 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.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 | | 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 PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB | dB | | | 0 | | | | 0 | | | | 0 | | 0 | | | | |

| OCNG_RA ^{Note 1} | dB | | | | | | | | | | | | | | | | | |
|--|---------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| OCNG_RB ^{Note 1} | dB | | | | | | | | | | | | | | | | | |
| N_{oc} Note 3 | dBm/15 kHz | | -1 | 01 | | | -1 | 01 | | -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 | |
| 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 | , | AWGN | | | | |
| Antenna Configuration | | | 1> | x2 | | | 1: | x2 | | | 1: | x2 | | 1x2 | | | | |
| Timing offset to Cell 1 | μs | | | - | | | | 0 | | | |) | | 3 | | | | |
| Time alignment error relative to cell 1 Note 5 | μs | | - | - | | | ≤⊺ | AE | | | ≤⊺ | AE | | N/A | | | | |
| Time alignment error relative to cell 2 Note 5 | μs | | | - | | | | - | | | <u></u> ≤⊺ | AE | | 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 | | 1, 2, 3 | | | | | | | |
| | 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 | | | | | | | |
| | 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 | | | | | | |
| | 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 | | S | ≤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 | | (| Cell 1 | | | | C | ell 2 | | | Се | II 3 | | Cell 4 | | | | | |
|---------------------------------------|---|----|-------|-----------------------|-----|----|--------------|--------------|------------------|----------------|----|----------|-----------------|----|----------------------------------|----------|-----------------|----|--|--|
| | | T1 | T2 | T | 3 | T4 | T1 | T2 | T3 | T4 | T1 | T2 | T3 | T4 | T1 | T2 | Т3 | T4 | | |
| E-UTRA RF | | | | 1 | | | | | 2 | | | | 3 | | | 3 | | | | |
| Channel Number | | | | | | | | | | | | | | | | | | | | |
| BW _{channel} | MHz | | | : N _{RB,c} = | | | | | $N_{RB,c} = 25$ | | | | $I_{RB,c} = 25$ | | $5MHz: N_{RB,c} = 25$ | | | | | |
| | 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100 | | | | | | | | $N_{RB,c} = 50$ | | | 10MHz: I | | | | | $N_{RB,c} = 50$ | | | |
| 77.0011 | | | | | | | | | $N_{RB,c} = 100$ | | | 20MHz: N | | 0 | 20MHz: N _{RB,c} = 100 | | | | | |
| PDSCH | | | | z: R.4 T | | | N/A | N/A | N/A | 5MHz: | | N | /A | | N/A | | | | | |
| parameters: | | | | z: R.0 T | | | | | | R.7 FDD | | | | | | | | | | |
| DL Reference Measurement | | | 20MH | z: R.3 T | טט | | | | | | | | | | | | | | | |
| Channel | | | | | | | | | | 10MHz : R.3 | | | | | | | | | | |
| Charmer | | | | | | | | | | FDD | | | | | | | | | | |
| | | | | | | | | | | 20MHz | | | | | | | | | | |
| | | | | | | | | | | : R.6 | | | | | | | | | | |
| | | | | | | | | | | FDD | | | | | | | | | | |
| PCFICH/PDCCH/P | | | 5MHz | : R.11 T | DD | | | 5MHz: I | R.11 FDD | 1 100 | | 5MHz: F | R.11 FDD | | 5MHz: R.11 FDD 10MHz: R.6 FDD | | | | | |
| HICH parameters | | | | z: R.6 T | | | | | R.6 FDD | | | | R.6 FDD | | | | | | | |
| | 20MHz: R.10 TDD | | | | | | R.10 FDD | | | 20MHz: I | | | 20MHz: R.10 FDD | | | | | | | |
| OCNG Pattern | | | 5MHz | : OP.9 T | TDD | | 5MHz: | 5MHz: | 5MHz: | 5MHz: | | 5MHz: O | P.16FDD | ; | 5MHz: OP.16FDD; | | | | | |
| defined in A.3.2.1 | | | | :: OP.1 | | | OP.16 | OP.16 | OP.16 | OP.20 | | 10MHz:C | | , | 10MHz:OP.2 FDD; | | | | | |
| | | | 20MHz | : OP. 7 | TDD | | FDD; | FDD; | FDD; | FDD; | | 20MHz: 0 | P.12FDI | D | | 20MHz: (| OP.12FDD | | | |
| | | | | | | | 10MHz | 10MHz | 10MHz | 10MHz | | | | | | | | | | |
| | | | | | | | :OP.2 | :OP.2 | :OP.2 | :OP.10 | | | | | | | | | | |
| | | | | | | | FDD; | FDD; | FDD; | FDD; | | | | | | | | | | |
| | | | | | | | 20MHz | 20MHz | 20MHz | 20MHz | | | | | | | | | | |
| | | | | | | | : | : | : | : OP.17 | | | | | | | | | | |
| | | | | | | | OP.12 FDD | OP.12 FDD | OP.12 FDD | FDD | | | | | | | | | | |
| PBCH_RA | dB | | | | | | 100 | ווו | וועטון |] | | | | | | | | | | |
| 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 | | | | | | | | | | I | | | | | | | | | |
| PDSCH_RB OCNG_RA ^{Note 1} | dB dB | - | | | | | | | | | | | | | | | | | | |
| OCNG_RA | | | | | | | | | | | | | | | | | | | | |
| OCNG_KB | G_RB ^{Note 1} dB | | | | | | | | | | | | | | | | | | | |

| $N_{oc}^{ m Note 3}$ | dBm/15 kHz | | -1 | 01 | | | -1 | 01 | | -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 | | | ÁW | GN | , | , | ÁW | GN | | AWGN | | | | |
| Antenna Configuration | | | 1) | K 2 | | | 1: | K 2 | | | 1) | (2 | | 1x2 | | | | |
| 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 | - | | | | | , | - | | | ≤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: 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. | | | | |
| Confi | gured deactivated | | Cell 2 | Configured deactivated secondary cell on | | | | |
| SCel | | | OGII Z | RF channel number 2. | | | | |
| | gured deactivated | | Cell 3 | Configured deactivated secondary cell on | | | | |
| | SCell | | 0011 0 | RF channel number 3. | | | | |
| Neigl | Neighbour cell | | Cell 4 | Neighbor cell to be identified on RF | | | | |
| | | | | 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 | | | | |
| | | | 3 | 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. | | | | |
| Filter | 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 | T2 | | ≤30 | UE should report Event A6 within 25.6s | | | | |
| | | | | (20xscellMeasCycle) | | | | |
| | T3 | | 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 | | Се | II 1 | | | Ce | II 2 | | | Ce | ell 3 | | Cell 4 | | | |
|-----------------------------------|------|----|-------------------|----------|----|---------------|---------------|------------------------|---------------|---|----------|-----------------|-------------------------------|--------------------------------|----------|-----------------|----|
| | | T1 | T2 | T3 | T4 | T1 | T2 | Т3 | T4 | T1 | T2 | T3 | T4 | T1 | T2 | T3 | T4 |
| E-UTRA RF Channel | | | 1 | 1 | | | 2 | 2 | | | | 3 | | | | 3 | |
| Number | | | | | | | | | | | | | | | | | |
| BW _{channel} | | | 5MHz: N | | | | | I _{RB,c} = 25 | | | | $I_{RB,c} = 25$ | | | | $I_{RB,c} = 25$ | |
| | | | 10MHz: N | | | | | $N_{RB,c} = 50$ | | 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$ | | | 10MHz: N _{RB,c} = 50 | | | | |
| DD00H | | | 20MHz: N | | 1 | N1/A | | $I_{RB,c} = 100$ | 584LL | | | |) | 20MHz: N _{RB,c} = 100 | | |) |
| PDSCH parameters: DL Reference | | | 5MHz: F 10MHz: | | | N/A | N/A | N/A | 5MHz: R.7 | N/A | | | N/A | | | | |
| Measurement Channel | | | 20MHz: | | | | | | FDD | | | | | | | | |
| Measurement Chamilei | | | ZUIVINZ. | K.0 FDD | | | | | 10MHz: | | | | | | | | |
| | | | | | | | | | R.3 | | | | | | | | |
| | | | | | | | | | FDD | | | | | | | | |
| | | | | | | | | | 20MHz: | | | | | | | | |
| | | | | | | | | | R.6 | | | | | | | | |
| | | | | | | | | | FDD | | | | | | | | |
| PCFICH/PDCCH/PHICH | | | 5MHz: R | | | | | 2.11 FDD | | | | R.11 FDD | | | | R.11 FDD | |
| parameters | | | 10MHz: | | | | | R.6 FDD | | | | R.6 FDD | | | | R.6 FDD | |
| | | | 20MHz: F | | | | | R.10 FDD | 1 | | | R.10 FDD | | | | R.10 FDD | |
| OCNG Pattern defined | | | 5MHz: Of | | | 5MHz: | 5MHz: | 5MHz: | 5MHz: | | | P.16 FDD | | | | P.16 FDD | |
| in A.3.2.1 | | | 10MHz: O | | | OP.16 | OP.16 | OP.16 | OP.20 | | | OP.2 FDD | | | | OP.2 FDD | |
| | | | 20MHz: O | P.17 FDD |) | FDD 10MHz: | FDD 10MHz: | FDD 10MHz: | FDD 10MHz: | | 20MHz: C |)P.12 FDL | J | | 20MHZ: C |)P.12 FDE |) |
| | | | | | | OP.2 | OP.2 | OP.2 | OP.10 | | | | | | | | |
| | | | | | | FDD | FDD | FDD | FDD | | | | | | | | |
| | | | | | | 20MHz: | 20MHz: | 20MHz: | 20MHz: | | | | | | | | |
| | | | | | | OP.12 | OP.12 | OP.12 | OP.17 | | | | | | | | |
| | | | | | | FDD | FDD | FDD | FDD | | | | | | | | |
| PBCH_RA | dB | | | | | | | | | | | | | | | | |
| PBCH_RB | dB | | | | | | | | | | | | | | | | |
| PSS_RA | dB | | | | | | | | | | | | | | | | |
| SSS_RA | dB | | | | | | | | | | | | | | | | |
| PCFICH_RB | dB | | | | | | | | | | | | | | | | |
| PHICH_RA | dB | | , | 1 | | | | 1 | | | | 0 | | | | 0 | |
| PHICH_RB | dB | | (| J | | | , | 0 | | | | U | | | | 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 | | -101 | | | -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 | | , | ÁW | 'GN | | , | ÁW | GN | | | ÁW | 'GN | |
| Antenna Configuration | | | 1: | x2 | | | 1: | κ2 | | | 1> | (2 | | | 1) | x2 | |
| Timing offset to Cell 1 | μs | | | - | | | (|) | | | (|) | | | 3 | 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_{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.8.16.33.2 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 | | | | | |
|-------|-----------------------------|------|---------|---|--|--|--|--|--|
| E-UT | RA RF Channel | | 1, 2, 3 | three radio channels are used for this test | | | | | |
| Num | ber | | 1, 2, 3 | | | | | | |
| Activ | e PCell | | Cell 1 | Primary cell on RF channel number 1. | | | | | |
| Conf | igured deactivated | | Cell 2 | Configured deactivated secondary cell on | | | | | |
| SCel | | | Gell 2 | RF channel number 2. | | | | | |
| Conf | igured deactivated | | Cell 3 | Configured deactivated secondary cell on | | | | | |
| SCel | | | Oeli 3 | RF channel number 3. | | | | | |
| Neigl | Neighbour 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 both cells | | | | | |
| | k-downlink | | 1 | As specified in table 4.2-2 in TS 36.211. | | | | | |
| | guration | | | 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 | | | | | |
| | | | · · | 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. | | | | | |
| | individual 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 | | | | | |
| TC | | _ | | cells 1, 2 and 3 but not cell 4. | | | | | |
| T2 | | S | ≤30 | UE should report Event A6 within 25.6s | | | | | |
| | | _ | 4 | (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.8.16.34.1-2: 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 | | | | $20MHz: N_{RB,c} = 100$ | | | | 20MHz: N _{RB,c} = 100 | | |
| PDSCH | | | 5MHz: R.4 TDD N/A N/A N/A 5MHz: N/A | | | | N/A | | | N | I/A | | | | | | |
| parameters: | | | 10MHz: R.0 TDD 20MHz: R.3 TDD | | | | | | R.4 | | | | | | | | |
| DL Reference | | | | | | | | | 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 | | -1 | 01 | | | -1 | 01 | | -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 | | AWGN | | | | ÁW | GN | | , | ÁW | 'GN | , | |
| Antenna Configuration | | | 1) | (2 | | | 1: | x2 | | | 1: | (2 | | | 1 | x2 | |
| Timing offset to Cell 1 | μs | | | - | | | (| 0 | | | (|) | | 3 | | | |
| Time alignment error relative to cell 1 Note 5 | μs | | | - | | | ≤T | AE | | | ≤ T | AE | | 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, 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.

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.8.16.35.1-1: General test parameters for known 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, 0 | |
| Active PCell | | Cell 1 | Primary cell on RF channel number 1. |
| Deconfigured deactivated | | Cell 2 | Deconfigured deactivated secondary cell |
| SCell1 | | Cell 2 | 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 | | O | subframe |
| Cell-individual offset for cells | dB | 0 | Individual offset for cells on PCC. |
| on RF channel number 1 | uБ | U | |
| 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 | uБ | O | |
| SCell measurement cycle | ms | 320 | |
| (measCycleSCell) | 1113 | 320 | |
| T1 | | | During this time the PCell and SCell2 shall |
| | S | 7 | be known and the SCell1 configured and |
| | | | detected. |
| T2 | s | 1 | During this time the UE shall activate the |
| | 0 | ļ | SCell1. |
| T3 | S | 1 | During this time the UE shall deactivate |
| | 3 | ı | 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.

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.8.16.36.1-1: 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 | | | | | |
| 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 | 10MHz: $N_{RB,c} = 50$ | | | |
| | | $20MHz: N_{RB,c} =$ | 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 TDD | | 10MHz: R.6 FDD | | | 10M | IHz: R.6 F | DD | |
| DL Reference | | 20MHz: R.10 T | DD | 20MHz: R.10 FDD | | | 20MI | Hz: R.10 F | -DD | |
| Measurement Channel | | | | | | | | | | |
| OCNG Patterns | | 5MHz: OP.9 TD | | 5MHz: OP.16 FDD | | | 5MH | z: OP.16 F | -DD | |
| | | 10MHz: OP.1 TDD | | 10MHz: OP.2 FDD | | | _ | Hz: OP.2 F | | |
| | | 20MHz: OP.7 TD | DD | 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 | | | | | | | | | |
| | | | | | | | 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, 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.

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.8.16.37-1: 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 | | |
| 77011 71 | | 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 | | |
| Ê _s /N _{oc} | dB | 17 | 17 | 17 | | |
| Ê _S /I _O Note 3 | dB | 17 | 17 | 17 | | |
| RSRP 1000 | 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 | · | | | | | |
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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.

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.

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.8.16.38-1: 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 |
| D v v channel | | 10MHz: $N_{RB,c} = 25$ | 10MHz: $N_{RB,c} = 20$ | 10MHz: $N_{RB,c} = 20$ |
| | | 20MHz: $N_{RB,c} = 100$ | 20MHz: $N_{RB,c} = 100$ | 20MHz: $N_{RB,c} = 100$ |
| PDSCH parameters: | | 5MHz: R.4 TDD | - 100 | 201VII 12. 14RB,c = 100 |
| 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 | | | | |
| OCNG Patterns | | 5MHz: OP.9 TDD | 5MHz: OP.10 TDD | 5MHz: OP.10 TDD |
| - | | 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 /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 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 | upped purch that o | Il colle ere fully ellegated | and a constant total trans- | mittad navyar anastral |

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. 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 already 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, 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.

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.8.16.39.1-1: General test parameters for unknown 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 | 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.8.16.39.1-2: 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 | | | | |
| 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 already 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

| 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 | | - | - |
| TDD uplink-downlink configuration | | 1 | | - | - |
| BW _{channel} | MHz | 5MHz: N _{RB,c} = 25 | 5ML | Hz: N _{RB,c} = 25 | 5MHz: N _{RB,c} = 25 |
| DVV channel | IVII IZ | $10MHz: N_{RB,c} = 50$ | 10MI | Hz: $N_{RB,c} = 50$ | $10MHz: N_{RB,c} = 50$ |
| PDSCH parameters: | | 20MHz: N _{RB,c} = 100 5MHz: R.4 TDD | ZUIVIF | $Hz: N_{RB,c} = 100$ | 20MHz: N _{RB,c} = 100 |
| DL Reference | | 10MHz: R.0 TDD | | - | - |
| Measurement Channel | | 20MHz: R.3 TDD | | | |
| PCFICH/PDCCH/PHIC | | 5MHz: R.11 TDD | 5ME | lz: R.11 FDD | 5MHz: R.11 FDD |
| H parameters: | | 10MHz: R.6 TDD | | lHz: R.6 FDD | 10MHz: R.6 FDD |
| DL Reference | | 20MHz: R.10 TDD | | Hz: R.10 FDD | 20MHz: R.10 FDD |
| Measurement Channel | | | | | |
| 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 | | | | ļ , |
| 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.8.16.40.2 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) and (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. |
| T3 | S | 1 | During this time the UE shall deactivate the SCell1 and SCell2. |

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 | C | ell 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 | | $N_{RB,c} = 25$ | 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 | | | | |
| PCFICH/PDCCH/PHICH | | 20MHz: R.6 FDD 5MHz: R.11 FDD | 5M⊔z: | 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 | | | | | 202 | |
| OCNG Patterns | | 5MHz: OP.20 FDD | 5MHz: (| 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 | | | | | |
| 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 | |
| | 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/ | -87 | -infinity | -87 | -87 | |
| Note 3 | 15 kHz | | | | | |
| SCH_RP Note 3 | dBm/ | -87 | -infinity | -87 | -87 | |
| To Note 3 | 15 kHz | F0 40 - 40l | 70.00 | F0 40 : 40l | F0.40 : 40 | |
| 10 100 | 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 | μS | - | < | 0 0 ≤ TAE ≤ TAE | | |
| Time alignment error relative to cell 1 Note 5 | μδ | - | | ., _ | <u> </u> | |
| 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 T2 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 r to the principle defined in s | | | pendent of channel bandwidth and is performed according |

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 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.4 TDD | | - | - | |
| DL Reference Measurement | | 10MHz: R.0 TDD | | | | |
| Channel | | 20MHz: R.3 TDD | | D 44 TDD | CMILE, D.44 TDD | |
| PCFICH/PDCCH/PHICH parameters: | | 5MHz: R.11 TDD 10MHz: R.6 TDD | | R.11 TDD z: R.6 TDD | 5MHz: R.11 TDD 10MHz: R.6 TDD | |
| DL Reference Measurement | | 20MHz: R.10 TDD | | : R.10 TDD | 20MHz: R.10 TDD | |
| Channel | | 201VII 12. TV. TO TDD | 2011112 | 14.10 100 | 20101112.113.110 120 | |
| OCNG Patterns | | 5MHz: OP.9 TDD | 5MHz: | OP.10 TDD | 5MHz: OP.10 TDD | |
| | | 10MHz: OP.1 TDD | | : 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 | | | | | |
| N _{oc} Note 2 | dBm/ | -104 | | -104 | -104 | |
| | 15 kHz | | | | | |
| Ê _s /N _{oc} | dB | 17 | -infinit | 17 | 17 | |
| Ê _s /I _{ot} Note 3 | dB | 17 | -infinit | 17 | 17 | |
| RSRP Note 3 | dBm/ | -87 | -infinit | -87 | -87 | |
| Note 2 | 15 kHz | | | | | |
| SCH_RP Note 3 | dBm/ | -87 | -infinit | -87 | -87 | |
| lo Note 3 | 15 kHz | | | | | |
| lo note o | 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 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.8.17 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 | alue | Comment |
|---|------|---|---|---|
| | | Test 1 | Test 2 | |
| PCell | | С | ell 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 | | | ell 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 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 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 | | (| 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' '00000000111111111' Cell 3: Cell 3: '11110000' '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.8.17.1.1-2: 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 | dB | 0 | N/A | N/A | | | | |
| PHICH_RB PDCCH_RA | 1 | | | | | | | |
| 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 | | | | |
| $\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$ | dB | 0 | -Infinity | -Infinity | | | | |
| Propagation Condition Note 1: OCNG sha | | ETU30 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 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.8.17.1.1-3: 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 | T3 | T2 | Т3 | T2 | T3 | |
| E-UTRA RF | | 1 | | 2 | | 2 | | |
| Channel Number | | | | | | | | |
| Correlation Matrix | | 1x2 Low | | 1x2 Low | | 1x2 Low | | |
| and Antenna | | | | | | | | |
| Configuration | | | | | | 00.0 | ı | |
| OCNG patterns | | OP.5 FDD | | OP.6 FDD | | OP.6 | N/A | |
| defined in A.3.2.1 | | | | | | FDD | | |
| PBCH_RA | <u> </u> | | | | | | | |
| PBCH_RB | <u> </u> | | | | | | | |
| PSS_RA | <u> </u> | | | | | | | |
| SSS_RA | <u> </u> | | | | | | | |
| PCFICH_RB | | | | | | | | |
| PHICH_RA | dB | 0 | | 0 | | 0 | N/A | |
| PHICH_RB | <u> </u> | | | | | | | |
| PDCCH_RA | | | | | | | | |
| PDCCH_RB | | | | | | | | |
| OCNG_RA ^{Note 1} | | | | | | | | |
| OCNG_RB ^{Note 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 | |
| ${ m \hat{E}}_{ m s}/N_{oc}^{ m Note~4}$ | 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 | | Cell 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 | | Normal | | 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 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. | |
| 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 |
| ТЗ | 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 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 | | | |
| $\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$ | dB | 0 | -Infinity | -Infinity | | | |
| Propagation Condition Note 1: OCNG sha | all be used s | 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: lo 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 | | | | 2 | | | | |
| Correlation Matrix | | 1x2 | 2 Low | 1x2 | Low | 1x2 | Low | |
| and Antenna | | | | | | | | |
| Configuration | | | | | | 00.0 | 1 | |
| OCNG patterns defined in A.3.2.2 | | OP. | 1 TDD | OP.2 | TDD | OP.2 TDD | N/A | |
| | | | | | | טטו | 1 | |
| PBCH_RA | 1 | | | | | | | |
| PBCH_RB | | | | | | | | |
| PSS_RA | - | | | | | | | |
| SSS_RA | <u> </u> | | | | | | | |
| PCFICH_RB | 10 | | • | | | | N1/A | |
| PHICH_RA | dB | | 0 | 0 | | 0 | N/A | |
| PHICH_RB | <u> </u> | | | | | | | |
| PDCCH_RA | <u> </u> | | | | | | | |
| PDCCH_RB | | | | | | | | |
| OCNG_RA ^{Note 1} | | | | | | | | |
| OCNG_RB ^{Note 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 $\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$ | 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 | | | | ETU | 130 | | | |

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 TS 36.331 [2], Clause 6.3.2 |
| longDRX-CycleStartOffset | sf320 | 13 30.331 [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.

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.8.17.3.1-2: 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 |

Io levels have been derived from other parameters for information purposes. They are Note 1:

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 | T3 |
| OCNG patterns defined in A.3.2.1 | | OP.13 FDD | | OP.14 FDD | | OP.14 FDD | N/A |
| lo 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.8.17.1.1-3 for the other parameters. Note 2:

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.

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.8.17.4.1-2: 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.3.2.2 | | OP.7 TDD | N/A | N/A |
| lo Note 1 | dBm/ 18 MHz | -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.8.17.2.1-2 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 | T3 |
| OCNG patterns defined in A.3.2.2 | | OP.7 TDD | | OP.8 TDD | | OP.8 TDD | N/A |
| lo Note 1 | dBm/ 18 MHz | -66.93 | N/A | N/A | -63.67 | -67.09 | 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.8.17.4.2 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

| Param | eter | Unit | Cell 1 | 1 Cell 2 | | | | |
|-----------|---|--------|--------|----------|-----|--|--|--|
| | | dBm/ | -67.22 | N/A | N/A | | | |
| lo Note 1 | 9 MHz | -07.22 | IN/A | | | | | |
| 10 | 10 | | N/A | N/A | N/A | | | |
| | | 4.5MHz | IN/A | IN/A | | | | |
| Note 1: I | 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 |
| Note 1 | dBm/ 9 MHz | -69.94 | N/A | N/A | N/A | N/A | N/A |
| lo Note 1 | 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 | Value | | 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 9 MHz | 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.

This test verifies the RRM requirement which is independent of channel bandwidth and is performed Note: 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 Channel I | Measurement 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.

This test verifies the RRM requirement which is independent of channel bandwidth and is Note 2: 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 |

lo levels have been derived from other parameters for information purposes. Note 1: They are not settable parameters themselves.

See Table A.8.17.1.1-2 for the other parameters.

Note 2:

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 |

lo levels have been derived from other parameters for information purposes. They are Note 1: 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: 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.8.17.8.1-3: 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 | T3 | T2 | T3 |
| 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 |
|-----------|----------------|--------|--------|--------|
| lo Note 1 | dBm/ 18 MHz | -64.21 | N/A | N/A |
| 10 | 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 | Т3 |
| 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 | V | 'alue | Comment |
|--|------|---|---|--|
| | | Test 1 | Test 2 | |
| PCell | | С | Cell 1 | PCell is on RF channel 1 (PCC). |
| SCell 1 | | С | Cell 2 | SCell 1 on RF channel 2 (SCC1). |
| SCell 2 | | C | Cell 3 | SCell 2 on RF channel 3 (SCC2). Cell 3 is the assistance data reference cell. |
| Other neighbor cell | | - | 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 – 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 1 [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 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 | | 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 | dB | 0 | N/A | N/A | N/A | |
| PHICH_RB PDCCH_RA | | | | | | |
| PDCCH_RB | | | | | | |
| OCNG_RA ^{Note 1} | | | | | | |
| OCNG_RB ^{Note 1} | dDm/ | | | | | |
| $N_{oc}^{ m Note 3}$ | 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 | |
| $\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$ | dB | 0 | -Infinity | -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: 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 | Се | II 2 | Се | II 3 | Cell 4 | 1 |
|--|-------------------|----------------------------|---|----------------------------|---|----------------------------|---|---|---------------|
| | | T2 | T3 | T2 | T3 | T2 | Т3 | T2 | T3 |
| E-UTRA RF Channel Number | | , | 1 | 2 | 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 Lo | W |
| 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 z: 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 z: OP.5 DD : OP.13 | FI 10MHz FI 20MHz | OP.19 DD z: OP.6 DD : OP.14 | FI 10MH; FI 20MHz | OP.19 DD z: OP.6 DD : OP.14 | 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 Iz:100 | 10MF | z: 25 Hz: 50 Iz:100 | 10MF | z: 25 Hz: 50 Hz: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 | | _ | lz: 2 Hz: 1 Hz:1 | 10M | lz: 2 Hz: 1 Hz:1 | 10M | lz: 2 Hz: 1 Hz: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 | 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 $\hat{E}_{_{\mathrm{S}}}/I_{_{\mathrm{ot}}}^{}$ Note 4 | dB | -4 | - Infinity | - Infinity | -1 | - Infinity | -1 | -8 | - Infinity |

| lo 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 | | 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.8.17.10.1-4: 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 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.8.17.10.2 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,

$$T_{PRS}\left(M-1\right)+160\left\lceil\frac{n}{M}\right\rceil,$$

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

| Par | ameter | Unit | Value | | Comment |
|-----|--------|------|--------|--------|---------|
| | • | | Test 1 | Test 2 | |

| PCell | | Ce | ·II 1 | PCell is on RF channel 1 (PCC). |
|--|-----|--|---|---|
| SCell 1 | | | ell 2 | SCell 1 on RF channel 2 (SCC1). |
| SCell 2 | | Се | ell 3 | SCell 2 on RF channel 3 (SCC2). Cell 3 is the assistance data |
| Other neighbor cell | | Ce | ell 4 | reference cell. Neighbor cell on RF channel 3 (SCC2). |
| PCFICH/PDCCH/PHIC H parameters | | | Measurement R.6 TDD | As specified in clause A.3.1.2.2 |
| Channel Bandwidth (BW _{channel}) | MHz | 5MHz or 10M | lHz or 20MHz | All channels in a test have the same bandwidth. |
| PRS configuration index I_{PRS} | | 174 for all cells on PCC 184 for all cells on SCC1 194 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 |
| Physical cell ID PCI | | (PCI of Cell 3 – 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 |
| 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 |
| CP length | | Nor | mal | $4384 \cdot T_{\rm s}$ |
| DRX | | |)N | DRX parameters are further |
| Radio frame receive time offset between the cells at the UE antenna connector | μs | | Cell 2: 1 Cell 2: -1 Cell 2: 3 | PRS are transmitted from synchronous cells |
| Time alignment errors among cell1, cell2 and cell3 | μs | specified in 3GP | ment error as P TS 36.104 [30] 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 | | 16 cells | s in total | The list includes the reference cell (received in <i>OTDOA</i> - |

| | | 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 PCC: 310 Cells on SCC1: 320 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]. |
| 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 |
| Т2 | 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 | | • | 14// (| 1071 | 14// (| |
| Channel Bandwidth (BW _{channel}) | MHz | 5,10,20 | N/A | N/A | N/A | |
| Correlation Matrix and | | 1x2 Low | 1x2 Low | 1x2 Low | 1x2 Low | |
| Antenna Configuration | | | | | | |
| | | 5MHz: R11 TDD | | | | |
| PCFICH/PDCCH/PHICH | | 10MHz: R6 | N 1/A | | . | |
| parameters as specified | | TDD | N/A | N/A | N/A | |
| in clause A.3.1.2.1 | | 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 | IN/A | |
| | | 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/ 15 kHz | -95 | N/A | N/A | N/A | |
| PRS $\hat{\mathbf{E}}_{\mathrm{s}}/N_{\mathit{oc}}$ | dB | -Infinity | -Infinity | -Infinity | -Infinity | |
| lo Note 4 | dBm/ 9 MHz | -67.22 +10log (N _{RB,c} /50) | N/A | N/A | N/A | |
| $\hat{\mathbf{E}}_{s}/N_{oc}$ | dB | 0 | -Infinity | -Infinity | -Infinity | |
| Propagation Condition | | ETU30 | | | | |
| | L | L | | | | |

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 | II 1 | | II 2 | Ce | II 3 | Cell 4 | , |
|-----------|------|----|------|----|------|----|------|--------|----|
| | | T2 | T3 | T2 | Т3 | T2 | Т3 | T2 | Т3 |

| E-UTRA RF Channel Number | | 1 | l | 2 | 2 | ; | 3 | 3 | |
|--|-------------------|-----------------------------------|------------------------------|----------------------------|--|----------------------------|---|---|---------------|
| Correlation Matrix and Antenna Configuration | | 1x2 Low | | 1x2 | Low | 1x2 | Low | 1x2 Lo | w |
| Channel Bandwidth (BW _{channel}) | MHz | 5,10 |),20 | 5,10 | 0,20 | 5,10 | 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 | :: R11 DD Iz: 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 | :: OP.1)D :: OP.7 | TE 10MHz TE 20MHz | OP.10 DD :: OP.1 DD :: OP.7 | TI 10MHz TI 20MHz | 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 | _ | z: 25 Hz: 50 Hz:100 | 10MF | z: 25 Hz: 50 Hz:100 | 10MF | z: 25 Hz: 50 Hz: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 | | 5MH 10MI 20M | | _ | lz: 2 Hz: 1 Hz:1 | 10M | Hz: 2 Hz: 1 Hz: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_RA PDCCH_RB OCNG_RA OCNG_RB Note 1 | dB | (|) | (|) | | 0 | 0 | N/A |
| PRS_RA | dB | -6 | N/A | N/A | 3 | N/A | 3 | 3 | N/A |
| $N_{oc}^{ m Note 3}$ | dBm/ 15 kHz | -98 | -98 | -98 | -95 | -98 | -95 | -98 | -95 |
| | | | | | | 1 | | T . | |
| PRS $\hat{\mathbf{E}}_{\mathrm{s}}/N_{\mathit{oc}}$ | 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 | | | | | Е | 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.8.17.11.1-4: 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 | 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 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 (E-UTRA) | | | |
|--------------------------------------|--------------|---|------------------|--|--|
| | | T1 | T2 | | |
| E-UTRA RF Channel | | , | | | |
| 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 | | | | |
| 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 | -9 | 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 | | ETI | | | |
| constant total tran OFDM symbols. | smitted powe | both cells are fully a r spectral density is | achieved for all | | |

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 |
| $\frac{\text{Control} E_{b}}{N_{t}} (38.4 \text{ kbps})$ | 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 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 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 (BW _{channel}) | MHz | 10 | |
| CDMA2000 1X Channel Number | | 1 | One CDMA2000 1X carrier frequency is used. |
| Inter-RAT (CDMA2000 1X) measurement quantity | | CDMA2000 1xRTT Pilot 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 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.3.2.2.1 (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 |
| RSRP | dBm/15 kHz | -94 -94 |
| SCH_RP | dBm/15 kHz | -94 -94 |
| Propagation Condition | | ETU70 |
| Note 1: OCNG shall be used | auch that both o | alls 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: 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 (cdm | na2000 1X) |
|--|-------------------|---------------|------------|
| | | T1 | T2 |
| Pilot E _c I _{or} | dB | -7 | |
| Sync E _c I _{or} | dB | -16 | |
| $\frac{\text{Paging} \text{E}_{c}}{\text{I}_{or}} \text{(4.8 kbps)}$ | 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 | | ETU | J70 |

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 | Cel | II 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 | | 10 | |
| Correlation Matrix | | 1x2 Low | | 1x2 Low | | 1x2 Low | |
| and Antenna | | | | | | | |
| Configuration | | | | | | | |
| OCNG Patterns | | | | | | | |
| defined in | | OP.1 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 | | | | | 0 | |
| SSS_RA | dB | | | | | | |
| PCFICH_RB | dB | | | | | | |
| PHICH_RA | dB | | | | | | |
| PHICH_RB | dB | 0 | | 0 | | | |
| PDCCH_RA | dB |] | | | | | |
| PDCCH_RB | dB |] | | | | | |
| PDSCH_RA | dB | 1 | | | | | |
| PDSCH_RB | dB | 1 | | | | | |
| OCNG_RA ^{Note 1} | dB | | | | | | |
| OCNG_RB ^{Note 1} | dB | | | | | | |
| $N_{oc\ 	ext{Note 3}}$ | dBm/15 kHz | -98 | | | | | |
| RSRP Note 4 | dBm/15 kHz | -94 | -94 | -Infinity | -91 | -94 | -94 |
| \hat{E}_{s}/I_{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 | | | | | |
| 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 $N_{\it ac}$ 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 |
|--|------|--|---|
| 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. |
| 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 for Scell | | 3 | One TDD carrier frequencies 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 |
| 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 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 | 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 | Cel | I 1 | Ce | Cell 2 | | II 3 | |
|--|--------------------|----------------|----------------|-----------------|-------------------|----------------|------------|--|
| | | T1 | T2 | T1 | T2 | T1 | T2 | |
| E-UTRA RF | | 1 | | | 2 | ; | 3 | |
| Channel Number | | | | | | | | |
| BW _{channel} | MHz | 10 | 0 | 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 | | | | | | | | |
| 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 | C | 1 | 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 | -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 | |
| \hat{E}_s/N_{oc} | dB | 4 | 4 | -Infinity | 7 | 4 | 4 | |
| Propagation | | ETU70 | | | | | | |
| Condition | | | | | | | | |
| Note 1: OCNG sh | nall be used such | that both cell | s are fully al | located and a c | onstant total tra | ansmitted powe | r spectral | |
| | achieved for all C | | | | | • | - | |

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 | Unit | Value | 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 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 | | | | 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 | | |
| Note 4. Con Table A 0.00.0.4.4 for other general test personators | | | | | |

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 | | Ce | Cell 3 | | |
|--|---------------|--------|-----|------|--------|--|--|
| | | T1 | T2 | T1 | T2 | | |
| E-UTRA RF Channel | | 1 | | 2 | 2 | | |
| Number | | | | | | | |
| BW _{channel} | MHz | 10 |) | 1 | 0 | | |
| Correlation Matrix | | 1x2 L | _OW | 1x2 | Low | | |
| and Antenna | | | | | | | |
| Configuration | | | | | | | |
| OCNG Pattern | | | | | | | |
| defined in A.3.2.1.1 | | OP.1 | FDD | 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 | | (| 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 | 1 | | |
| \hat{E}_s/N_{oc} | dB | 4 | 4 | 4 | 1 | | |
| N_{oc} | dBm/15 | | | -98 | | | |
| | kHz | | | | | | |
| RSRP | dBm/15 kHz | -94 | -94 | -9 |)4 | | |
| SCH_RP | dBm/15 | -94 | -94 | -9 |)4 | | |
| | kHz | | | | | | |
| Propagation | | | E | TU70 | | | |
| Condition | | | | | | | |

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 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/Io | 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 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 | Cell 1 | | C | ell 3 |
|--|-----------|--------|-----|-----|-------|
| | | T1 | T2 | T1 | T2 |
| E-UTRA RF Channel Number | | | 1 | | 2 |
| BW _{channel} | MHz | 1 | 0 | | 10 |
| Correlation Matrix and Antenna | | 1x2 | Low | 1x2 | 2 Low |
| Configuration | | | | | |
| OCNG Pattern defined in A.3.2.2.1 (OP.1 | | OP 1 | TDD | OP | 1 TDD |
| TDD) | | 01.1 | 100 | 01. | 1 100 |
| PBCH_RA | dB |] | | | |
| PBCH_RB | dB |] | | | |
| PSS_RA | dB | ļ | | | |
| SSS_RA | dB | ļ | | | |
| PCFICH_RB | dB | | | | |
| PHICH_RA | dB | | | | |
| PHICH_RB | dB | 0 | 0 | 0 | 0 |
| PDCCH_RA | dB | | | | |
| PDCCH_RB | dB | ļ | | | |
| PDSCH_RA | dB | | | | |
| PDSCH_RB | dB | ļ | | | |
| OCNG_RA ^{Note1} | dB | | | | |
| OCNG_RB ^{Note1} | dB | | | | |
| $\hat{	extbf{E}}_{	ext{s}}/	extbf{I}_{	ext{ot}}$ | 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 | | ETU70 | | | - |
| | | | | | |

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 | | (|) | 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 ^{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 parameters | | DL Reference Measurement | As specified in section | |
| | | Channel R.3 TDD | A.3.1.1.2 | |
| PCFICH/PDCCH/PHICH | | DL Reference Measurement | As specified in section | |
| parameters | | Channel R.10 TDD | 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.8.20.4A.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 | | Cell 3 | |
|--|---|--|---|--|
| | T1 | T2 | T1 | T2 |
| MHz | 20 20 | | :0 | |
| | 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 | 2 | 20 | 1 | 10 |
| OCNG Pattern defined in A.3.2.2 | | OP.7 | 7 TDD | OP.1 | I 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".

Note 2: The test case assumes an environment where CSG proximity detection results not being impact by non-

Note 2: The test case assumes an environment where CSG proximity detection results not being impact by non-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 | T3 | T1 | T2 | Т3 |
| 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 | | | | | | |
| 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 | 0 | -inf | 4 | 7 | -inf | 7 |
| $N_{oc}^{ m Note~2}$ | 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_RB ^{Note 1} | 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 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.

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 | | Unit Cell 1 | | Unit Cell 1 | | Cell 2 |
|---------------------------|---------------|--------|--------|-------------|--------------------|-------------|--|--------|
| | | T1 | T2 | T1 | T2 | | | |
| E-UTRA RF Channel | | | 1 | | 1 | | | |
| Number | | | | | | | | |
| BW _{channel} | MHz | 1 | 10 | | 10 | | | |
| Measurement | 10 | | -37 | 1 | 3-37 | | | |
| bandwidth | $n_{\it PRB}$ | | | | | | | |
| 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 | | | | | | | |
| 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 | | | | | | | |
| $N_{oc}^{ m Note~2}$ | 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 | | | U30 | | TU30 | | | |
| Correlation Matrix and | | | Low | | 2 Low | | | |
| Antenna Configuration | | | - | | - | | | |
| Timing offset to Cell 1 | μs | | - | 2.3 | (CP/2) | | | |
| 20000 | μο | | | | \-·-/ | | | |

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 T1 T2 | | | Cell 2 | | |
|---------------------------|--------------------------------|-----------------|--------|----------------|--------------------|--|--|
| | | | | T1 | T2 | | |
| E-UTRA RF Channel | | 1 | | | 1 | | |
| Number | | | | | | | |
| BW _{channel} | MHz | 10 | | 10 | | | |
| Measurement | 10 | 13 | -37 | 1 | 13-37 | | |
| bandwidth | $n_{{\scriptscriptstyle PRB}}$ | | | | | | |
| 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 | 2.2 TDD | | |
| (OP.1 TDD) and in | | | | | | | |
| A.3.2.2.2 (OP.2 TDD) | | | | | | | |
| 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 | | | | | | |
| 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 | | ET | J30 | | TU30 | | |
| Correlation Matrix and | | | Low | | 2 Low | | |
| Antenna Configuration | | | | | | | |
| Timing offset to Cell 1 | μs | | - | 2.3 | (CP/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: 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 for 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 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

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 |
| Gap Oliset | | 9 | As specified in 13 30.331 clause 0.3.3 |
| 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 T1 T2 | | | Cell 2 | | |
|---------------------------|--------------------------------|-----------------|--------|-----------|---|--|--|
| | | | | T1 | T2 | | |
| E-UTRA RF Channel | | 1 | | | 2 | | |
| Number | | | | | | | |
| BW _{channel} | MHz | 10 | | 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 | | | 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 | | | | | | |
| 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 | | |
| 11.5.5.5.5.5.5.5. | 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 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

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 | | Cell 2 | | |
|---------------------------|----------------------------|--------|--------|-----------|---------------|--|
| | | T1 | T1 T2 | | T2 | |
| E-UTRA RF Channel | | 1 | | | 2 | |
| Number | | | | | | |
| BW _{channel} | MHz | 10 | | 10 | | |
| Measurement | n_{PRB} | 13- | ·37 | 1 | 3-37 | |
| bandwidth | 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 | | | | ļ | | |
| OCNG Patterns | | 05.4 | TDD | | 0.700 | |
| defined in A.3.2.2.1 | | OP.1 | טטו | OP OP | .2 TDD | |
| (OP.1 TDD) and in | | | | | | |
| A.3.2.2.2 (OP.2 TDD) | ID. | | | | | |
| 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 | | | | | |
| $N_{oc}^{ m Note~2}$ | 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 | | ETU | | | TU30 | |
| Correlation Matrix and | | 1x2 | | | 2 Low | |
| Antenna Configuration | | | | | | |
| Timing offset to Cell 1 | μs - 3 (Synchronous cells) | | | | ronous cells) | |
| Note 1: OCNC shall be | | u II | | | | |

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 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

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 | 30 | |

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 | Cell 1 | | Cell 2 | | |
|---|----------------------|-----------------------|-------------------|---------------|-------------------|--|
| | | T1 | T2 | T1 | T2 | |
| E-UTRA RF Channel | | 1 | | | 1 | |
| Number | | | | | | |
| BW _{channel} | MHz | | 0 | | 10 | |
| Measurement | n _{PRB} | 13-37 | | | 13-37 | |
| bandwidth | | | | | | |
| PDSCH parameters | | DL Reference | Measurement | DL Referen | ce Measurement | |
| | | Channel R.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 | | | 0 | | |
| SSS_RA | dB | | | | | |
| PCFICH_RB | dB | | , | | | |
| 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 | -9 | | .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 2 | | Specied in (| columns for cell1 | |
| CSI reference signal | | - | 2 | | 4 | |
| configurations [16] | | | | | | |
| CSI-RS subframe | | 0 | | | 0 | |
| offset | 40 | | | | 0 | |
| CSI-RS individual | dB | 0 | | | 0 | |
| offset [2] | 1 | | | - | -nahla | |
| CSI-RS muting | | Enable ETU30 | | | Enable | |
| Propagation Condition | 120 | <u> </u> | USU | | ETU30 | |
| Timing offset to cell 1 Note 1: OCNG shall be | US Lead such that | t both colla ara f | ully allocated as | | 3 (CP/2) | |

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.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 28160ms ($22*Max\{T_{DMTC_periodicity}, DRX$ 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 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.8.22.6 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 | 30 | |

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— | 40 | | | 40 | |
| BW _{channel} | MHz | 10 13-37 | | 10 | | |
| Measurement | n _{PRB} | 13 | -37 | 13-37 | | |
| bandwidth | | DI Deference | Magauramant | DI Deferen | aa Maaauramant | |
| DDCCII navamatava | | | Measurement | | ce Measurement | |
| PDSCH parameters | | | 0 TDD as in | | R.0 TDD as in | |
| | | | 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 | | | 0 | | |
| SSS_RA | dB | | | | | |
| PCFICH_RB | dB | | 2 | | | |
| 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 | | | | | |
| 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 | <u></u> | |
| CSI reference signal | | | 2 | | 4 | |
| configurations [16] | | _ | | | • | |
| CSI-RS subframe | | 0 | | | 0 | |
| offset | | J | | | • | |
| CSI-RS individual | dB | 0 | | | 0 | |
| offset [2] | | J | | | - | |
| CSI-RS muting | | Enable | | F | nable | |
| Timing offset to cell 1 | us | | 0 | | 3 (CP/2) | |
| | | that both calls 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_{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 | As specified in clause 6.3.2 in | |
| 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 | 30 | |

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 Number | | , | 1 | | 2 |
| BW _{channel} | MHz | 10 | | | 10 |
| Measurement | | 13-37 | | 13-37 | |
| bandwidth | n _{PRB} | 13 | -51 | 10.01 | |
| PDSCH parameters | | DI Peference | Measurement | DI Peferen | ce Measurement |
| 1 Door parameters | | | 0 FDD as in | | R.0 FDD as in |
| | | | 1.1.1 | | .3.1.1.1 |
| PCFICH/PDCCH/PHIC | | | Measurement | | ce Measurement |
| H parameters | | | 6 FDD as in | | R.6 FDD as in |
| . i parametere | | | 1.2.1 | | 3.1.2.1 |
| Correlation Matrix and | | | Low | | x2 Low |
| Antenna Configuration | | 17.2 | 2011 | | AL 2011 |
| OCNG Patterns | | | | | |
| defined in A.3.2.1.1 | | OP.1 | FDD | OF | P.2 FDD |
| (OP.1 FDD) and in | | | | | |
| À.3.2.1.2 (ÓP.2 FDD) | | | | | |
| PBCH_RA | dB | | | | |
| PBCH_RB | dB | | | | |
| PSS_RA | dB | | | 0 | |
| SSS_RA | dB | | | | |
| PCFICH_RB | dB | | | | |
| 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 |
| $N_{oc}^{ m Note~3}$ | dBm/15 KHz | -9 | | ·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:== /4.5.121.1 | 0.4 | 0.4 | landin-ite : | 0.4 |
| | 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 60 | -94 60 | -Infinity | -94 |
| Dropogation Condition | dBm/9 MHz | -60 -60 | | | ified for cell 1 |
| Propagation Condition | | | | U30 | 1 |
| CSI reference signal | | 2 | | | 4 |
| configurations [16] | | | | | |
| CSI-RS subframe offset | | 0 | | | 0 |
| CSI-RS individual | dB | 0 | | 1 | 0 |
| offset [2] | uD | 0 | | | U |
| CSI-RS muting | | Enable | | | Enable |
| Timing offset to cell 1 | us | | - - | | 3us |
| 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_{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 | For further information see | |
| TimeAlignmentTimer | sf500 | 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 5632ms 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 | 30 | |

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

| T1 | Parameter | Unit | Ce | II 1 | Cell 2 | | |
|--|-------------------------|------------------|--------------|-------------|------------|------------------|--|
| Number | | | T1 | T2 | T1 | T2 | |
| BW Description BR BR BR BR BR BR BR B | E-UTRA RF Channel | | 1 | | 2 | | |
| Measurement | Number | | | | | | |
| Dandwidth | BW _{channel} | MHz | 1 | 0 | 10 | | |
| Dandwidth | | n _{PRB} | 13-37 | | | | |
| Channel R.O TDD as in A.3.1.1.2 | bandwidth | | | | | | |
| Channel R.O TDD as in A.3.1.1.2 | | | DL Reference | Measurement | DL Referen | ce Measurement | |
| A.3.1.1.2 | ' | | | | | | |
| H parameters | | | | | | | |
| H parameters | PCFICH/PDCCH/PHIC | | DL Reference | Measurement | DL Referen | ce Measurement | |
| Note Correlation Matrix and Antenna Configuration National Configuration | H parameters | | Channel R. | 6 TDD as in | Channel | R.6 TDD as in | |
| Note Correlation Matrix and Antenna Configuration National Configuration | · | | A.3.1 | .2.2. | Α. | 3.1.2.2. | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1 TDD) and in A.3.2.1.2 (OP.2 TDD) | Correlation Matrix and | | | | | | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1 TDD) and in A.3.2.1.2 (OP.2 TDD) | Antenna Configuration | | | | | | |
| (OP.1 TDD) and in A.3.2.1.2 (OP.2 TDD) A.B ASEL RA dB PBCH_RA dB PBCH_RB dB PSS_RA dB PSS_RA dB PCFICH_RB dB PHICH_RA dB PDCCH_RA dB PDCCH_PB dB PDSCH_RA dB PDSCH_RB dB OCNG_RA ^{NOIG 1} dB OCNG_RA ^{NOIG 1} dB OCNG_RA ^{NOIG 1} dB OCNG_RB ^{NOIG 2} dB 6 6 6 6 7 O PS A A 4 PS (NoIG 2) dB 4 -1.46 -Infinity -1.46 CSI-RS Ê _x /I _{ot} dB M/15 KHz -94 -1.46 CSI-RSP NoIG 4 dBm/15 KHz -94 -94 -Infinity -94 CSI-RSRP NoIG 4 dBm/15 KHz -94 -94 -Inf | | | | | | | |
| A.3.2.1.2 (ÔP.2 TDD) | defined in A.3.2.1.1 | | OP.1 | TDD | OF | P.2 TDD | |
| PBCH_RA | (OP.1 TDD) and in | | | | | | |
| PBCH_RB | À.3.2.1.2 (ÓP.2 TDD) | | | | | | |
| PSS_RA | | dB | | | | | |
| PSS_RA | PBCH_RB | dB | | | | | |
| SSS_RA | | dB | | | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | 1 | | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | (|) | | 0 | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | | |
| PDCCH_PB | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | 6 | 6 | 6 | 6 | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | - | , , , | _ | _ | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | N _{oc} Note 5 | dBill/10 Ril2 | | | 50 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | \hat{F}/N | dB | 4 | 4 | -Infinity | 4 | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | - | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | crs Ê /I | dB | 4 | -1.46 | -Infinity | -1.46 | |
| RSRP Note 4 dBm/15 KHz -94 -94 -94 -94 -94 | | | | | | | |
| 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 Io dBm/9 MHz -60 -60 As specificed for cell1 Propagation Condition ETU30 ETU30 CSI reference signal configurations [16] 2 4 CSI-RS subframe offset 0 0 CSI-RS individual offset [2] dB 0 0 CSI-RS muting Enable Enable | CSI-RS Ê./I | dB | 10 | 4.54 | -Infinity | 4.54 | |
| CSI-RSRP Note 4 dBm/15 KHz -88 -88 -Infinity -88 SCH_RP Note 4 dBm/15 KHz -94 -94 -Infinity -94 Io dBm/9 MHz -60 -60 As specificed for cell1 Propagation Condition ETU30 CSI reference signal configurations [16] 2 4 CSI-RS subframe offset 0 0 Offset 0 0 CSI-RS individual offset [2] dB 0 0 CSI-RS muting Enable Enable | | dDm/15 KUz | 0.4 | 0.4 | Infinity | 0.4 | |
| SCH_RP Note 4 dBm/15 KHz -94 -94 -Infinity -94 Io dBm/9 MHz -60 -60 As specificed for cell1 Propagation Condition ETU30 CSI reference signal configurations [16] 2 4 CSI-RS subframe offset 0 0 CSI-RS individual offset [2] dB 0 0 CSI-RS muting Enable Enable | Noto 4 | | _ | | | | |
| Io dBm/9 MHz -60 -60 As specificed for cell1 Propagation Condition ETU30 CSI reference signal configurations [16] 2 4 CSI-RS subframe offset 0 0 CSI-RS individual offset [2] dB 0 0 CSI-RS muting Enable Enable | COLL DD Note 4 | | | | | | |
| Propagation Condition ETU30 CSI reference signal configurations [16] 2 4 CSI-RS subframe offset 0 0 CSI-RS individual offset [2] dB 0 0 CSI-RS muting Enable Enable | | | _ | | | | |
| CSI reference signal configurations [16] 2 4 CSI-RS subframe offset 0 0 CSI-RS individual offset [2] dB 0 0 CSI-RS muting Enable Enable | | abm/9 MHZ | -60 | | | liced for cell i | |
| configurations [16] 0 0 CSI-RS subframe offset 0 0 CSI-RS individual offset [2] 0 0 CSI-RS muting Enable Enable | | | | | 030 | | |
| CSI-RS subframe offset 0 0 CSI-RS individual offset [2] dB 0 0 CSI-RS muting Enable Enable | | | | ۷ | | 4 | |
| offset 0 0 CSI-RS individual offset [2] 0 0 CSI-RS muting Enable Enable | | 1 | | 2 | | 0 | |
| CSI-RS individual dB 0 0 0 offset [2] Enable Enable | | | | J | | U | |
| offset [2] CSI-RS muting Enable Enable | | -15 | | 2 | | | |
| CSI-RS muting Enable Enable | | aR | | U | | U | |
| | | | | | | | |
| | | | <u>Ena</u> | abie | <u> </u> | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted | Timing offset to cell 1 | us | | - | <u> </u> | 3 | |

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 5632ms 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-U1 | RA RF Channel | | 1, 2 | Two radio channels are used for this test |
| Num | Number | | 1, 2 | |
| Activ | Active 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 |
| | | | | channel number 2. |
| | 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 | -PeriodOffset for cells 2 | ms | 10 | As specified in IE MeasDS-Config in TS |
| and | 3 | | | 36.331 |
| Disc | overy signal occasion | ms | 1 | 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 |
| | | | 33 | 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 |
| | | | | tolerance in clause 9.1.14.2 into account |
| | Daniert en la con | | F-I | plus margin. |
| | Report on leave | _ | False | |
| 0-11 | Time To Trigger Individual offset for cells | S | 0 | In this interest for a till an entire and |
| | | dB | 0 | Individual offset for cells on primary |
| _ | F channel number 1 individual offset for cells | dB | | component carrier. Individual offset for cells on secondary |
| | | ub | 0 | component carrier. |
| | on RF channel number 2 Filter coefficient | | 0 | |
| | I measurement cycle | mc | | L3 filtering is not used |
| | isCycleSCell) | ms | 320 | |
| T1 | iooyoieooeii) | S | 10 | |
| T2 | | S | 10 | |
| T3 | | S | 5 | |
| 10 | | 3 | J | |

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} | | | | | 10 01 | | | 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 | | | | | | | | | | |
| SSS_RA | dB | | | | | | | | | | |
| PCFICH_RB | dB | | | | | | | | | | |
| PHICH_RA | dB | | | | | | | | | | |
| PHICH_RB | dB | | 0 | | | 0 | | | 0 | | |
| PDCCH_RA | dB | | U | | | U | | | 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/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 | -3 - 1.10 | -31.10 | 70.20 | Opecine | Cell 2 | 11113 101 | |
| Propagation Condition | | | ETU30 | 71.40 | | ETU30 | 70.20 | | ETU30 | | |
| Correlation Matrix and | | | 1x2 Low | | | 1x2 Low | | | 1x2 Low | | |
| Antenna Configuration | | | . AL 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 | <u>-</u> | | | | - 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 | Т3 | 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} | | | | | 10 01 | | | 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 | | | | | | | | | | |
| SSS_RA | dB | | | | | | | | | | |
| PCFICH_RB | dB | | | | | | | | | | |
| PHICH_RA | dB | | | | | | | | | | |
| PHICH_RB | dB | | 0 | | | 0 | | | 0 | | |
| PDCCH_RA | dB | | U | | | | | | 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 | -3 -1 .10 | -51.10 | 70.20 | Ореспіс | Cell 2 | 11113 101 | |
| Propagation Condition | | | ETU30 | 71.40 | | ETU30 | 70.20 | | 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 | | _ | | ≤ TAE | | | N/A | | | |
| relative to cell 1 Note 5 | μδ | <u>-</u> | | | | = 1/1L | | | | | |
| Timing offset to Cell 2 | μs | | - | | - 2.3 (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-UT | RA RF Channel | | 1, 2 | Two radio channels are used for this test | | |
| Num | | | , | | | |
| | e PCell | | Cell 1 | Primary cell on RF channel number 1. | | |
| Conf | igured deactivated | | Cell 2 | Configured deactivated secondary cell on | | |
| SCel | | | OGII Z | RF channel number 2. | | |
| Neig | hbour cell | | Cell 3 | Neighbor cell to be identified on RF | | |
| | | | 000 | channel number 2. | | |
| DMT | C period | ms | 160 | As specified in IE MeasDS-Config in TS | | |
| | D : 10" + " II 0 | | 40 | 36.331 | | |
| | -PeriodOffset for cells 2 | ms | 10 | As specified in IE MeasDS-Config in TS | | |
| and 3 | | | | 36.331 As specified in IE MeasDS-Config in TS | | |
| durat | overy signal occasion | ms | 1 | 36.331 | | |
| CP le | | | Normal | 30.331 | | |
| DRX | | | OFF | Continuous monitoring of primary cell | | |
| A2 | Hysteresis | dB | 0 | Hysteresis for evaluation of event A2. | | |
| 7,2 | Threshold RSRP | dBm | 0 | Actual RSRP threshold for event A2. | | |
| | THICSHOID INOIN | abiii | | Needs to take absolute accuracy tolerance | | |
| | | | -93 | 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 | ı. | - | component carrier. | | |
| | individual offset for cells | dB | 0 | Individual offset for cells on secondary | | |
| | F channel number 2 coefficient | | 0 | component carrier. L3 filtering is not used | | |
| | I measurement cycle | ms | U | L3 lillering is not used | | |
| | sCycleSCell) | 1115 | 320 | | | |
| | timing offset to cell1 | 110 | 0 | | | |
| | alignment error | μS | ≤ Time alignment | The value of time alignment error depends | | |
| | een cell2 and cell1 | μs | error as specified | upon the type of carrier aggregation. | | |
| DOW | OON OONE WING OON I | | in TS 36.104 [30] | apon the type of barrier aggregation. | | |
| | | | clause 6.5.3.1. | | | |
| Cell3 | timing offset to cell1 | μS | 3 | Synchronous cells | | |
| T1 | <u> </u> | S | 10 | 27 1 200 00 | | |
| T2 | | S | 10 | | | |
| T3 | | S | 5 | | | |
| NOT | This to the side of the side o | - 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.8.22.11.1-2: 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 |
| E-UTRA RF Channel | | | 1 | | | | | | | |
| Number | | | | | 2 | | | 2 | | |
| BW _{channel} | MHz | | 10 | | 10 | | | | 10 | |
| Measurement | n _{PRB} | | 13-37 | | | 13-37 | | | 13-37 | |
| bandwidth | | | | | | | | | | |
| PDSCH parameters | | | Reference | | | Reference | | | Referen | |
| | | | Measurement Channel R.0 | | | ment Char | | | ement Cl | |
| | | | as in A.3.1 | | | as in A.3.1 | | R.0 FDD | | |
| PCFICH/PDCCH/PHIC | | | _ Reference | - | | _ Reference | - | | Referen | |
| H parameters | | | ment Chan | | | ment Char | | | ement Cl | |
| | | FDD | as in A.3.1 | .2.1 | FDD | as in A.3.1 | .2.1 | R.6 FDD | | 3.1.2.1 |
| Correlation Matrix and | | | 1x2 Low | | | 1x2 Low | | 1 | 1x2 Low | |
| Antenna Configuration | | | | | | | | | | |
| OCNG Patterns | |] . | OD 4 EDE | |] . | 2D 2 EDE | | _ | ם מ בסס | |
| defined in A.3.2.1.1 | | · ' | OP.1 FDD | | (| OP.2 FDD | | | P.2 FDD | ' |
| (OP.1 FDD) and in | | | | | | | | | | |
| A.3.2.1.2 (OP.2 FDD) | 40 | | | | | | | | | |
| PBCH_RA | dB dB | | | | | | | | | |
| PBCH_RB PSS_RA | dВ | | | | | | | | | |
| SSS_RA | | | | | | | | | | |
| | dB | | | | | | | | | |
| PCFICH_RB | dB | | | | | | | | | |
| PHICH_RA | dB | | 0 | | | 0 | | | 0 | |
| PHICH_RB PDCCH RA | dB | | 0 | | | 0 | | | 0 | |
| PDCCH_RB | dB dB | | | | | | | | | |
| | | | | | | | | | | |
| PDSCH_RA | dB dB | | | | | | | | | |
| PDSCH_RB OCNG_RA ^{Note 1} | | | | | | | | | | |
| OCNG_RA OCNG_RB | dB | | | | | | | | | |
| Note 2 | dB | | 404 | | 4/ | | | <u> </u> | | |
| N _{oc} ^{Note 2} RSRP Note 3 | dBm/15 kHz | 00 | -101 | 404 | -10 | | | | | |
| CSI-RSRP Note 3 | dBm/15 kHz | -82 | -82 | -104 | -82 | -82 | -104 | -infinity | -82 | -104 |
| SCH_RP Note 3 | dBm/15 kHz | -76 | -76 | -98 | -76 | -76 | -98 | -infinity | -76 | -98 |
| | dBm/15 kHz dB | -82 19 | -82 19 | -104 | -82 19 | -82 19 | -104 -3 | -infinity | -82 19 | -104 -3 |
| Ê _s /N _{oc} | dВ | | | -3 -3 | | | | -infinity | | |
| CRS Ê _s /I _{ot} CSI-RS Ê _s /I _{ot} | dB dB | 19 25 | 19 25 | 3 | 19 | -0.05 5.95 | -4.76 1.24 | -infinity | -0.05 5.95 | -4.76 1.24 |
| | uB | 25 | 25 | 3 | 25 | 5.95 4 | 1.24 | -infinity | | 1.24 |
| CSI-RS resource | | | 2 | | | 4 | | | 6 | |
| configurations [2] p-C-r10 [2] | dB | | 6 | | | 6 | | | 6 | |
| CSI-RS subframe | UD. | | 0 | | | 0 | | | 0 | |
| offset | | | U | | | U | | | U | |
| CSI-RS individual | [dB] | | 0 | | | 0 | | | 0 | |
| offset [2] | [ub] | | U | | 0 | | | | U | |
| CSI-RS muting | | | Enable | | Enable | | | | Enable | |
| Propagation Condition | | | ETU30 | | Enable ETU30 | | | | ETU30 | |
| Time offset to cell 1 | us | | 0 | | | 0 | | | | \ |
| | Time offset to cell 1 | | | | | | | | | |

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.8.22.11.2 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

| eter | Unit | Value | Comment |
|----------------------------|-------------|---|---|
| annel | | 1, 2 | Two radio channels are used for this test |
| | | · | |
| | | Cell 1 | Primary cell on RF channel number 1. |
| tivated | | Cell 2 | Configured deactivated secondary cell on RF channel number 2. |
| | | Cell 3 | Neighbor cell to be identified on RF channel number 2. |
| | ms | 160 | As specified in IE MeasDS-Config in TS 36.331 |
| et for cells 2 | ms | 10 | As specified in IE MeasDS-Config in TS 36.331 |
| occasion | ms | 1 | As specified in IE MeasDS-Config in TS 36.331 |
| dth | MHz | 40 | Channel bandwidth for cells on primary |
| | | 10 | and secondary component carriers |
| | | Normal | |
| е | | 6 | As specified in table 4.2.1 in TS 36.211. |
| | | | The same configuration applies to all cells. |
| | | 1 | |
| | | OFF | Continuous monitoring of primary cell |
| S | dB | 0 | Hysteresis for evaluation of event A2. |
| I 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. |
| Trigger | S | 0 | |
| S | dB | 0 | Hysteresis for evaluation of event A6. |
| | 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. |
| leave | | False | |
| Trigger | S | 0 | |
| fset for cells number 1 | dB | 0 | Individual offset for cells on primary component carrier. |
| fset for cells number 2 | dB | 0 | Individual offset for cells on secondary component carrier. |
| | | 0 | L3 filtering is not used |
| nent cycle II) | ms | 320 | _ |
| et to cell1 | μs | 0 | |
| error nd 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. |
| et to cell1 | μs | 3 | Synchronous cells |
| | S | 5 | During this time the UE shall be aware of cells 1 and 2 but not cell 3. |
| | S | ≤12 | UE should report Event A6 within 6.08s (19×scellMeasCycle) |
| | S | 5 | UE should report Event A2 within 200 ms and 960s for cells 1 and 2, respectively. |
| est v | erifies the | s s s erifies the RRM req | s 5 s ≤12 |

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 | T3 | T1 | T2 | T3 | T1 | T2 | T3 |
| E-UTRA RF Channel | | | 1 | | | 2 | | | 2 | |
| Number | | | | | | | | | | |
| BW _{channel} | MHz | | 10 | | 10 | | | | 10 | |
| Measurement | n _{PRB} | | 13-37 | | | 13-37 | | | 13-37 | |
| bandwidth | | | | | | | | | | |
| PDSCH parameters | | | L Referenc | | | _ Referenc | | DL Reference | | |
| | | | Measurement Channel R.0 | | Measurement Channel R.0 | | | Measurement Channel | | |
| | | | As in A.3.1 | | | As in A.3.1 | | | As in A. | |
| PCFICH/PDCCH/PHIC | | | L Referenc | | | L Referenc | | | Reference | |
| H parameters | | | ement Char | | | ment Char | | | ement Cl | |
| | | טטו | as in A.3.1 | .2.2 | טטו | as in A.3.1 | .2.2 | | as in A. | 3.1.2.2 |
| Correlation Matrix and | | | 1x2 Low | | | 1x2 Low | | | 1x2 Low | |
| Antenna Configuration | | | | | | | | | | |
| OCNG Patterns defined in A.3.2.1.1 | | | OP.1 TDD | | | OP.2 TDD | | | P.2 TDD | |
| (OP.1 TDD) and in | | | טר.ו וטט | | ' | UP.2 1DD | | | יר.∠ וטט | |
| 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 | | | | | | | | | |
| PHICH_RB | dB | | 0 | | | 0 | | | 0 | |
| PDCCH_RA | dB | | Ū | | | Ü | | | J | |
| 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 | | | | -10 |)1 | | |
| 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 | | | • | | | ETU70 | | | l | l |
| CSI-RS resource | | | 0 | | | 2 | | | 4 | |
| configurations [2] | | | | | | | | | | |
| CSI-RS subframe | | | 0 | | | 0 | | | 0 | |
| offset | | | | | | | | | | |
| CSI-RS individual | [dB] | | 0 | | | 0 | | | 0 | |
| offset [2] | | | | | | | | | | |
| | | | Enable | | | Enable | | Enable | | |
| p-C-r10 [2] | dB | | 6 | | | 6 | | 6 | | |
| | us | | 0 | | | | | | | |
| configurations [2] CSI-RS subframe offset CSI-RS individual offset [2] CSI-RS muting p-C-r10 [2] Time offset to cell 1 | dB us | 0 0 Enable 6 | | 0 0 Enable 6 0 | | 0 0 Enable 6 2.3 (CP/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 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.8.22.12.2 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-UTR Numbe | A RF Channel er | | 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 | dBm | -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 | gth | | 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. |
| cells or | Cell-individual offset for cells on RF channel number 2 | | 0 | Individual offset for cells on carrier frequency of Cell2. |
| Filter c | 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 | | $MHz: N_{RB,c} =$ | | | $MHz: N_{RB,c} =$ | |
| | | | 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 FI | |
| Measurement Channel | | 20 | MHz: R.4 F | טט | 20 | OMHz: R.4 FI | טט |
| PCFICH/PDCCH/PHICH | | 51 | ИHz: R.11 F[| OD | 51 | MHz: R.11 F | DD |
| parameters: | | | MHz: R.6 F | | | MHz: R.6 F | |
| DL Reference | | | MHz: R.10 F | | | MHz: R.10 F | |
| Measurement Channel | | | | | | | |
| OCNG Patterns | | | IHz: OP.15 F | | | 1Hz: OP.15 F | |
| | | | MHz: OP.1 F | | | MHz: OP.1 F | |
| DDCIL DA | 40 | 201 | ИНz: ОР.11 F | -טט | 201 | ИНz: ОР.11 Г | -טט |
| PBCH_RA | dB | | | | | | |
| PBCH_RB | dB | | | | | | |
| PSS_RA | dB | | | | 0 | | |
| SSS_RA | dB | | | | | | |
| PCFICH_RB | dB | | | | | | |
| PHICH_RA | dB | | • | | | | |
| PHICH_PB | dB | | 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 | |
| | KHz | | | | | | 1 |
| \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 |
| | KHz | | | | | | |
| 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} |
| | | /50) | /50) | /50) | /50) | /50) | /50) |
| Propagation Condition | | , | ETU70 | , | , | ETU70 | |
| Correlation Matrix and | | | | | | 100 1 | |
| Antenna Configuration | | | 1x2 Low | | | 1x2 Low | |
| Receive Time offset to | μs | | - | | | 33 | |
| cell1 Note 5 | , | at both colls | - 33 | | | | ower. |

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 |
|--------------------------|---------|---------|------------------------------------|
| 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 | 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 |
|--------------------|-------|-------|---|
| 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.8.23.1.2 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 | Unit | Value | Comment |
|----------------|---|------|--------|--|
| E-UTR Numbe | RA RF Channel er | | 1, 2 | Two radio channels are used for this test. |
| 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 | dBm | -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 | ngth | | Normal | |
| DRX | | | ON | DRX related parameters are defined in Table A.8.23.2.1-3 |
| | dividual offset for n RF channel er 1 | dB | 0 | Individual offset for cells on primary component carrier. |
| | dividual offset for n RF channel er 2 | dB | 0 | Individual offset for cells on carrier frequency of Cell2. |
| Filter o | 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} = | | | MHz: N _{RB,c} = | | |
| BW _{channel} | MHz | | 10MHz: $N_{RB,c} = 50$ | | | $10MHz: N_{RB,c} = 50$ | | |
| | | | MHz: N _{RB,c} = | | | MHz: N _{RB,c} = | | |
| PDSCH parameters: | | | MHz: R.5 FD | | | MHz: R.5 FD | | |
| DL Reference | | | MHz: R.0 FI | | | 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 | MHz: 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 | | |
| | | | лнг. ОР.11 F | | | инт <u>г</u> . ОР.11 Г | | |
| PBCH_RA | dB | | | | | | | |
| PBCH_RB | dB | | | | | | | |
| PSS_RA | dB | | | | 0 | | | |
| SSS RA | dB | | | | | | | |
| PCFICH_RB | dB | | | | | | | |
| PHICH RA | dB | | | | | | | |
| PHICH_PB | dB | | 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 | | | | | | 1x2 Low | | |
| Antenna Configuration | | 1x2 Low | | | | IXZ LOW | | |
| Receive Time offset to cell1 Note 5 | μs | | - | | | 500 | | |

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 |
|--------------------------|---------|---------|------------------------------------|
| 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 | 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 |
|--------------------|-------|-------|---|
| 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.8.23.2.2 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 | | Value | Comment |
|---------|------------------------|-----------------|---|--|
| E-UTF | RA RF Channel | 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 |
| | | abiii | -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 | -99 | 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. |
| numb | er 1 | | | |
| Cell-ir | ndividual offset for | | | Individual offset for cells on carrier frequency |
| | on RF channel | dB | 0 | of Cell2. |
| numb | er 2 | | | |
| | coefficient | | 0 | L3 filtering is not used |
| T1 | | S | 5 | |
| T2 | | S | 10 | |
| T3 | | S | 1 | |
| NOTE | . This test verifies t | 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 | Т3 | T1 | T2 | T3 |
| E-UTRA RF Channel | | | 1 | | | 2 | |
| Number | | | | | | | |
| BW _{channel} | MHz | $5MHz: N_{RB,c} = 25$ | | | | $MHz: N_{RB,c} = 1$ | |
| | | | MHz: N _{RB,c} = | | | MHz: $N_{RB,c} =$ | |
| 77.0011 | | | MHz: N _{RB,c} = | | | $MHz: N_{RB,c} =$ | |
| PDSCH parameters: | | | MHz: R.4 TD | | | MHz: R.4 TD | |
| DL Reference | | | MHz: R.0 TI | | | MHz: R.0 TE | |
| Measurement Channel | | 20 | MHz: R.3 TI | טע | 20 |)MHz: R.3 TE | טכ |
| PCFICH/PDCCH/PHICH | | 51 | MHz: R.11 T[| DD | 51 | ИHz: R.11 Т | DD |
| parameters: DL Reference | | 10 | MHz: R.6 TI | DD | 10 | MHz: R.6 TE | DD |
| Measurement Channel | | 20 | MHz: R.10 T | DD | 20 | MHz: R.10 T | DD |
| OCNG Patterns | | 5 N | MHz: OP.9 TI | חר | E N | ЛНz: OP.9 TI | חח |
| OCING Patterns | | | MHz: OP.9 11 | | | MHz: OP.9 11 | |
| | | | MHz: OP.7 T | | | MHz: OP.7 T | |
| PBCH_RA | dB | 20 | IVII 12. OI ./ I | <i></i> | 20 | IVII 12. OF .1 1 | DD |
| PBCH_RB | dB | | | | | | |
| PSS_RA | dB | | | | | | |
| SSS_RA | dB | | | | | | |
| PCFICH_RB | dB | | | | | | |
| PHICH_RA | dB | | | | | | |
| PHICH_PB | dB | | 0 | | | 0 | |
| PDCCH_RA | dB | | Ü | | | Ü | |
| PDCCH_PB | dB | | | | | | |
| PDSCH_RA | dB | | | | | | |
| PDSCH_RB | dB | | | | | | |
| OCNG_RA ^{Note 1} | dB | | | | | | |
| OCNG_RB ^{Note 1} | dB | | | | | | |
| | dBm/15 | | -104 | | | -104 | |
| $N_{oc}^{ m Note~2}$ | KHz | | | | | | |
| $\hat{\mathbf{F}}$ /M | dB | 16 | -2.5 | 20 | 16 | -2.5 | 20 |
| \hat{E}_s/N_{oc} | | | | | | | |
| \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 |
| | KHz | | | | | | 0. |
| SCH_RP Note 3 | dBm/15 | -88 | -106.5 | -84 | -88 | -106.5 | -84 |
| | KHz | | | | | | |
| 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 | | 1x2 Low | | | | 1x2 Low | |
| Antenna Configuration | | IXZ LUW | | | | 1 AZ 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 | | | | | | | |

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 |
|--------------------------|---------|---------|------------------------------------|
| 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 | 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-UTF | RA RF Channel | | 1, 2, 3 | Three radio channels are used for this |
| Numb | er | | 1, 2, 3 | test. |
| Active | 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 |
| Measi | urement gap pattern | | 0 | |
| | ndividual offset for on RF channel er 1 | dB | 0 | Individual offset for cells on primary component carrier. |
| | ndividual offset for on RF channel er 2 | dB | 0 | Individual offset for cells on carrier frequency of Cell2. |
| | ndividual offset for on RF channel er 3 | dB | 0 | Individual offset for cells on carrier frequency of Cell3. |
| Filter | 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.

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 | T1 T2 T1 T2 | | T1 | T2 | |
| E-UTRA RF Channel Number | | | 1 | 2 | | 3 | |
| BW _{channel} | MHz | 10MHz: | $N_{RB,c} = 25$ $N_{RB,c} = 50$ $N_{RB,c} = 100$ | 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: l 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 | 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: 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 | | | 0 | | 0 | |
| PHICH_PB | dB | | 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 | | ET | U70 | ET | U70 | ETI | J70 |
| Correlation Matrix and Antenna Configuration | | 1x2 | Low | 1x2 | 1x2 Low | | Low |
| Receive Time offset to cell1 Note 4 | μs | | - | 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 power | | | | | | | |

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 |
|--------------------------|---------|---------|------------------------------------|
| 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.8.23.4.1-4: *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-UTR | 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 | rement gap pattern | | 0 | |
| ld | | | 0 | |
| Cell-in | Cell-individual 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. |
| numbe | | | | |
| | dividual offset for | dB | | Individual offset for cells on carrier frequency |
| | cells on RF channel | | 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 | T1 T2 T1 T2 | | T1 | T2 | | |
| E-UTRA RF Channel Number | | | 1 | | 2 | | 3 | |
| BW _{channel} | MHz | 10MHz: | $N_{RB,c} = 25$ $N_{RB,c} = 50$ $N_{RB,c} = 100$ | 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: $N_{RB,c} = 100$ | |
| 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 | 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: 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 | | | 0 | | 0 | | |
| PHICH_PB | dB | | 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 | | ET | U70 | ETU70 | | ETI | J70 | |
| Correlation Matrix and Antenna Configuration | | 1x2 Low | | 1x2 | 1x2 Low | | Low | |
| Receive time offset to cell1 Note 4 | μs | | - | 500 | | - | | |
| 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 power | | | | | | | | |

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-UTR | E-UTRA RF Channel | | 1 2 2 | Three radio channels are used for this |
| Numbe | Number | | 1, 2, 3 | 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 | | 6 | As specified in table 4.2-1 in TS 36.211. |
| | uration | | | The same configuration in both cells |
| | -downlink | | 1 | As specified in table 4.2-2 in TS 36.211. |
| configu | uration | | | The same configuration in both cells |
| DRX | | | ON | DRX related parameters are defined in |
| | | | 0.1 | Table A.8.23.4.1-3 |
| | rement gap pattern | | 0 | |
| ld | | | | |
| • | dividual offset for | | | Individual offset for cells on primary component carrier. |
| | n RF channel | dB | 0 | component carrier. |
| numbe | | | | Individual offert for calle an equipy frequency |
| | dividual offset for | ٩D | 0 | Individual offset for cells on carrier frequency of Cell2. |
| | n RF channel | dB | 0 | of odile. |
| | number 2 | | | Individual offset for cells on carrier frequency |
| | Cell-individual offset for cells on RF channel | | 0 | of Cell3. |
| numbe | | dB | O | 0.00.0. |
| | coefficient | | 0 | L3 filtering is not used |
| T1 | JOGINOIGHIL | S | 5 | Lo lilitering is not used |
| T2 | | S | 5 | |
| Note 1 | T1: | | | a independent of shapped bandwidth and is |

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 | |
| BW _{channel} | MHz | 10MHz: | $N_{RB,c} = 25$ $N_{RB,c} = 50$ $N_{RB,c} = 100$ | 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: l 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 | 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: 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 | | ET | U70 | ETU70 | | ETI | J70 | |
| Correlation Matrix and Antenna Configuration | | 1x2 | Low | 1x2 | 1x2 Low | | Low | |
| Receive Time offset to cell1 Note 4 | μs | | - | 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 power | | | | | | | | |

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 |
|--------------------------|---------|---------|------------------------------------|
| 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.8.23.6.1-4: *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 | 1 | Cell2 | Neighbour cell on RF channel number 2. |
| Final | Active PCell | 1 | Cell1 | PCell on RF channel number 1. |
| Condition | PSCell | 1 | 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 |
| Measuremer | Measurement gap pattern Id | | 0 | Gaps are configured before T2 and released before T3. |
| | iodicity and offset index on cell2 | | 0 | CQI reporting for PSCell every second subframe |
| | al offset for cells on | dB | 0 | Individual offset for cells on primary component carrier. |
| Cell-individua RF channel | al offset for cells on number 2 | dB | 0 | Individual offset for cells on carrier frequency of cell2. |
| T1 | | s | 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 | T3 | | 1 | During this time the UE adds the PSCell. |
| T4 | | s | 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.

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 | T3 | T4 | T5 | T1 | T2 | Т3 | T4 | T5 | |
| E-UTRA RF Channel Number | | | | 1 | | | | | 2 | | | |
| BW _{channel} | MHz | | 5MI | Hz: 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: | | | | Hz: R.5 I | | | | | - | | | |
| DL Reference | | | | /lHz: R.0 | | | | | | | | |
| Measurement | | | 201 | //Hz: R.4 | FDD | | | | | | | |
| Channel | | | | L D 44 | EDD | | EMILT, D.44 EDD | | | | | |
| PCFICH/PDCCH/PHI | | | | Hz: R.11 | | | 5MHz: R.11 FDD | | | | | |
| CH parameters: DL Reference | | | | //Hz: R.6 Hz: R.10 | | | 10MHz: R.6 FDD | | | | | |
| Measurement | | | 2010 | IMZ. K. 10 | ירטט | | 20MHz: R.10 FDD | | | | | |
| Channel | | | | | | | | | | | | |
| OCNG Patterns | | | 5ML | lz: ∩P 15 | FDD | | | 5MH: | 7: OP 16 | FDD | | |
| | | 5MHz: OP.15 FDD 10MHz: OP.1 FDD | | | | | 5MHz: OP.16 FDD 10MHz: OP.2 FDD | | | | | |
| | | 20MHz: OP.11 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 | | | | | |
| 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 | N/A -85 | | | | |
| A 1 | kHz | 4.0 | 1 40 | 1 40 | 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 | |
| SUI_KF | kHz | -02 | -02 | -02 | -02 | -02 | -irillility | -00 | -00 | -00 | -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 | |
| 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 | 1 | | | AWGN | | | AWGN | | | | | |
| Antenna Configuration | | 1x2 | | | | | 1x2 | | | | | |
| Receive time offset to cell1 Note 4 | μs | - | | | | | 33 | | | | | |
| | | | | | | | | | | | | |
| PRACH configuration Index ^{Note 5} | | 4 2 | | | | | | | | | | |
| | Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is | | | | | | | | | | | |

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 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 | | | |
| Measurement gap pattern Id | | | 0 | Gaps are configured before T2 and released before T3. | | | |
| CQI/PMI periodicity and offset configuration index on cell2 | | | 0 | CQI reporting for PSCell 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 carrier frequency of cell2. | | | |
| T1 | | S | 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 | | S | 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} : | | | |
| | | | | Hz: N _{RB,c} | | | | | 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 I | | |
| 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> | 20MHz: OP.11 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 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.

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

| Pa | rameter | 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 | 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 |
| Measuremen | t gap pattern Id | | 0 | Gaps are configured before T2 and released |
| | | | | before T3. |
| Special subfra | ame configuration | | 6 | As specified in table 4.2-1 in TS 36.211 |
| Uplink-downli | nk configuration | | 1 | As specified in table 4.2-2 in TS 36.211 |
| PRACH confi | guration on cell2 | | 53 | As specified in table 5.7.1-3 in TS 36.211 |
| CQI/PMI peri | odicity and offset | | 0 | CQI reporting for PSCell every uplink subframe |
| configuration | index on cell2 | | U | |
| Cell-individua | I offset for cells on | dB | 0 | Individual offset for cells on primary component |
| RF channel n | umber 1 | uБ | O | carrier. |
| Cell-individua | I offset for cells on | dB | 0 | Individual offset for cells on carrier frequency of |
| RF channel n | umber 2 | uБ | U | cell2. |
| T1 | | s | 5 | During this time the PCell shall be known and |
| | | 3 | 5 | cell2 shall be unknown. |
| T2 | | S | ≤ 5 | During this time the UE shall identify neighbour |
| | | 3 | 1 0 | 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: Th | is test verifies the RF | RM requii | ement which is | s independent of channel bandwidth and is |

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.3.11.

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 | Т3 | T4 | T5 | T1 | T2 | T3 | T4 | T5 |
| E-UTRA RF Channel Number | | | | 1 | | | | | 2 | | |
| BW _{channel} | MHz | | 5MI | Hz: N _{RB,c} | = 25 | | | 5MH | Iz: N _{RB,c} : | = 25 | |
| | | | $10MHz: N_{RB,c} = 50$ | | | | Hz: N _{RB,c} | | | | |
| | | | | Hz: N _{RB,c} | | | | 20MF | łz: 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 | | | 20IV | IHz: R.10 | טטו | | | 20M | Hz: R.10 | טטו | |
| Measurement Channel | | | 514 | . OD 0 | TDD | | | 51 AL I | 00.40 | TDD | |
| OCNG Patterns | | | | Hz: OP.9 | | | | | z: OP.10 | | |
| | | | | Hz: OP.1 | | | | | Hz: OP.2 | | |
| PBCH_RA | dB | | ZUIVI | Hz: OP.7 | טטו | | | ZUIVII | Hz: OP.8 | טטו | |
| PBCH_RB | dВ | - | | | | | | | | | |
| PSS_RA | dВ | - | | | | | | | | | |
| SSS_RA | dB | | | | | | | | | | |
| PCFICH_RB | dB | | | | | | | | | | |
| PHICH_RA | dВ | | | | | | | | | | |
| PHICH_RB | dВ | | | ^ | | | 0 | | | | |
| PDCCH_RA | dВ | | | 0 | | | U | | | | |
| _ | | | | | | | | | | | |
| PDCCH_RB PDSCH_RA | dB dB | | | | | | | | | | |
| PDSCH_RB | dB | | | | | | | | | | |
| OCNG_RA ^{Note 1} | dB | | | | | | | | | | |
| OCNG_RB ^{Note 1} | dB | | | | | | | | | | |
| N _{oc} Note 2 | dBm/15 | | | -101 | | | N/A | | _9 | 25 | |
| I 40C | kHz | | | -101 | | | IN// | -85 | | | |
| Ê _s /N _{oc} | dB | 19 | 19 | 19 | 19 | 19 | _ | 0 | 0 | 0 | 0 |
| _3.100 | 42 | 10 | 10 | | | .0 | infinity | | | | |
| \hat{E}_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 | | | | | | infinity | | | | |
| SCH_RP Note 3 | dBm/15 | -82 | -82 | -82 | -82 | -82 | - 1 | -85 | -85 | -85 | -85 |
| | kHz | | | | | | infinity | | | | |
| 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} /50) | | (N _{RB,c} /50) | (N _{RB,c} | (N _{RB,c} /50) | (N _{RB,c} /50) |
| Propagation Condition | | /30) | 730) | AWGN | 730) | /30) | | 730) | /50) AWGN | 730) | /50) |
| Antenna Configuration | | | | 1x2 | | | | | 1x2 | | |
| Receive time offset to | | | | 1 1/4 | | | | | | | |
| cell1 Note 4 | μs | | | - | | | | | 33 | | |
| PRACH configuration Index Note 5 | | | | 56 | | | | | 50 | | |
| Note 1: OCNG shall be | | at all cells | are fully a | llocated ar | nd a consta | ant total tra | nsmitted p | ower spec | tral density | y is achiev | ed for all |
| OFDM symbols. Note 2: Interference from | n other cells | | | | | | ed to be co | onstant ove | er subcarri | iers and tir | ne and |
| Shall be modelle Note 3: \hat{E}_s/I_{ot} , RSRP, SO | | | | | | | or informati | on nurnee | ac Thou o | re not cott | ahla |
| INULU J. Lg/ Iot, NONE, OL | יו_וגו מוועונ | 7 10 AGIS 119 | ve been u | ciivea iidi | п ошегра | iainetela l | , iiiiOiiiiali | on purpusi | oo. iiicy d | 5011 | anic |

Note 3: Ê_s/l_{ot}, RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

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.

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.

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 | | | | |
|---|----------------------------|-------------------|-----------------|----------|--|--|
| Parameter | Unit | 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} | | | | | | |
| $N_{oc}^{$ | 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 c | onstant total tra | ansmitted 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.8.24.1.2 **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 |
| E-OTRA RE Channel Number | | ļ | frequency is used. |
| Channel Bandwidth (BW _{channel}) | MHz | 5 | |
| Active cell | | Cell 1 | E-UTRA TDD Cell1 on RF |
| Active cell | | Cell I | 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 |
| | | ם וועבורים | 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 | l lmit | 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} | | | | | |
| $N_{oc}^{$ | 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 |
| Chariner Baridwidth (BVV channel) | IVII IZ | 3 01 10 | defined in clause A.3.12.3 |
| ProSe Direct Communication configuration | | As specified in Table | IE values unless specified |
| | | A.3.12.5-1 | otherwise in this test. |
| | | (Configuration #1) | |
| 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 | | | | |
|---|------------|-------------------------------------|---------|-------|--|--|
| | Onit | T1 | T2 | Т3 | | |
| E-UTRA RF Channel Number | | | 1 | | | |
| BW _{channel} Note 4 | MHz | | 5 or 10 | | | |
| OCNG Patterns defined in A.3.2.1.2 Note 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%.

The initiation/cease delay of SLSS transmissions can be expressed as: T_{evaluate,SLSS} + SLSS period, NOTE:

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

| D. | aramatar. | Unit | Tes | st 1 | Tes | st 2 | Tes | st 3 |
|--|---------------------------------------|---------------|--------|------------|--------|------------|--------------------------|------------|
| | arameter | Unit | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| E-UTRA RF Channel Number | | N 41 1 | 1 | | 1 | | 1 | |
| BW _{channel} | | MHz | | 0 | 10 | | 10 | |
| Measurement | | $n_{\it PRB}$ | | –27 | | –27 | | –27 |
| | ence measurement | | R.0 | - | R.0 | - | R.0 | - |
| channel define | | | FDD | | FDD | | FDD | |
| PDSCH allocat | | n_{PRB} | 13—36 | - | 13—36 | - | 13—36 | - |
| | CH/PHICH Reference channel defined in | | P.6 | FDD | R.6 | EDD | P.6 | FDD |
| A.3.1.2.1 | channer denned in | | 17.0 | רטט | 1.0 | ГОО | 1.0 | רטט |
| OCNG Pattern | s defined in A.3.2.1.1 | | OP.1 | OP.2 | OP.1 | OP.2 | OP.1 | OP.2 |
| | nd A.3.2.1.2 (OP.2 | | FDD | 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 ^{Note} | OCNG RA ^{Note1} | | | | | | | |
| OCNG_RB ^{Note} | | | | | | | | |
| | Bands FDD_A | | | | | | -1 | |
| | Bands FDD_B | | -106 | -106 | 06 -88 | 88 -88 | -115.5 -115 -114.5 | |
| $N_{oc}^{ m Note2}$ | Bands FDD_C Bands FDD_D | | | | | | | |
| ¹ V oc | Bands FDD F | dBm/15 kHz | | | | | | |
| | FDD_F Note 5 | | | | | | -114 -113 | |
| | Bands FDD_G Note 7 | | | | | | | |
| | Bands FDD_H | | | | | | -11 | 2.5 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | | 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 |
| | Bands FDD_B | | | | | | | .93 |
| | Bands FDD_C | | | | | | | .43 |
| Io ^{Note3} | Bands FDD_D Bands FDD F. | dBm/9 MHz | -70.27 | -70.27 | -52.27 | -52.27 | | .93 |
| | Bands FDD_E, FDD_F Note 5 | | | | | | -80 | .43 |
| | Bands FDD_G Note 7 | | | | | | | .43 |
| | Bands FDD_H | | | | | | -78 | .93 |
| \hat{E}_s/N_{oc} | | dB | 6 | 1 | 6 | 1 | 3 | -1 |
| Propagation co | ondition | - | 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. |
| 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

| Dox | am of a r | l lni4 | Test 1 | | Test 2 | | Test 3 | |
|--|---------------------|-----------------|--------|--------|--------|--------|--------|--------|
| | rameter | 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 | 10 | | 10 | |
| Special subfran | ne | | | 3 | | 6 | 6 | |
| configurationNot | 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 | - | 13—36 | - |
| PDCCH/PCFIC | H/PHICH | | | | | | | |
| Reference mea | surement channel | | R.6 | TDD | 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 | | | ļ | | | | İ | |
| PSS_RA | | | | | | | | |
| SSS_RA | | - | | | | | | |
| PCFICH_RB | | - | | | | | | |
| PHICH_RA PHICH_RB | | - JD | 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 | | 15 |
| | Bands TDD E | | | | | | | 14 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | | 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 | -82 | -87 | -112 | -116 |
| T.O.K. | Bands TDD_E | dBitty to Kitiz | 100 | 100 | 02 | 0, | -111 | -115 |
| | Bands TDD_A | | | | | | | 2.43 |
| lo ^{Note4} | Bands TDD_C | dBm/9 MHz | -70.27 | -70.27 | -52.27 | -52.27 | -81 | .43 |
| | Bands TDD_E | | | | | | | 0.43 |
| \hat{E}_s/N_{oc} | | dB | 6 | 1 | 6 | 1 | 3 | -1 |
| | ndition | - | _ | - | _ | - | _ | - |
| Propagation co | nullion | - | AW | GIN _ | AVV | GN | AVV | '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 $N_{\it oc}$ 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.9.1.2.3 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

| Parameter | | Unit | Tes | | Tes | |
|---|--|------------------------------|--------------|--------------|---|--|
| | | J | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| | E-UTRA RF Channel Number | | 10 | 2 | 10 | 2 10 |
| BW _{channel} Gap Pattern Id | | MHz | 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 DONGO 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

| D | omotor | 11!# | Tes | st 1 | Test 2 | |
|-----------------------|--|--------------------------------|--------|---------------|--------------------|--------|
| | ameter | Unit | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| | Channel Number | | 1 | 2 | 1 | 2 |
| BV | V _{channel} | MHz | 10 | 10 | 10 | 10 |
| Special subtran | ne configuration ^{Note1} k configuration ^{Note1} | | | <u>6</u> 1 | | |
| | Pattern Id | | 0 | - | 0 | - |
| · · | ent bandwidth | n | | | 22- | |
| | ence measurement | n_{PRB} | R.0 | | R.0 | |
| | ined in A.3.1.1.2 | | TDD | - | TDD | - |
| PDSCI | 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 | | OP.1 | OP.2 | OP.1 | OP.2 |
| _ ' ' | A.3.2.2.2 (OP.2 TDD) CH RA | | TDD | TDD | TDD | TDD |
| | CH_RB | | | | | |
| | SS_RA | | | 0 | | |
| | SS_RA | | 0 | | 0 | 0 |
| | ICH_RB CH_RA | | | | | |
| | CH_RB | dB | | | | |
| | CCH_RA | <u> </u> | | | | |
| | CH_RB | | | | | |
| | SCH_RA SCH_RB | | | | | |
| | G_RA ^{Note2} | | | | | |
| | G_RB ^{Note2} | | | | | |
| | Bands TDD_A | | | 3.65 -88.65 | (N_{oc}) | -117 |
| $N_{oc}^{ m Note3}$ | Bands TDD_C | dBm/15 kHz | -88.65 | | 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 |
| | tion condition | = | AW | 'GN | 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.

Table A.9.1.4.2-2: RSRP TDD—TDD Inter frequency test parameters for TDD configuration 0

| omotor | l lmi4 | Test 1 | | Test 2 | |
|--|--|--|--|-----------------|---|
| | Unit | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| | | 1 | 2 | 1 | 2 |
| V _{channel} | MHz | | | <u> </u> | 10 |
| k configuration Note1 | | | | | |
| | | | | | - |
| | n | | | | |
| | T PRB | | | | |
| ned in A.3.1.1.2 | | TDD | - | TDD | - |
| d allocation | $n_{\scriptscriptstyle PRB}$ | 13—36 | - | 13—36 | - |
| H/PHICH Reference channel defined in 3.1.2.2 | | R.6 | TDD | R.6 | TDD |
| defined in A.3.2.2.1 | | OP.1 | OP.2 | OP.1 | OP.2 |
| , , | | TDD | TDD | TDD | TDD |
| _ | | | | | |
| SS_RA | | | 0 | | |
| SS_RA | dB | 0 | | | |
| | | | | 0 | 0 |
| | | | | | |
| | | | | | |
| CH_RB | | | | | |
| SCH_RA | | | | | |
| | | | | | |
| | | | | | |
| _ | | | | 3.7 | 447 |
| | | | | | -117 |
| | dBm/15 kHz | -88.65 | -88.65 | | -116 |
| | | | | 2 +8dB) | -115 |
| $I_{ m ot}/I_{ m ot}$ | dB | 10 | 10 | 13 | -4 |
| Bands TDD_A | | | | (RSRP | -121 |
| Bands TDD_C | dBm/15 kHz | -78.65 | -78.65 | for Cell 2 | -120 |
| Bands TDD_E | | | | +25dB) | -119 |
| Bands TDD_A | | | | | -87.76 |
| Bands TDD_C | dBm/9 MHz | -50.45 | -50.45 | 2 | -86.76 |
| Bands TDD_E | | | | +19.75d B) | -85.76 |
| $/N_{oc}$ | dB | 10 | 10 | 13 | -4 |
| ion condition | - | AW | 'GN | AW | GN |
| | Hallocation H/PHICH Reference channel defined in 3.1.2.2 defined in A.3.2.2.1 d.3.2.2.2 (OP.2 TDD) CH_RA CH_RB SS_RA SS_RA ICH_RB CH_RB CH_RA CH_RB CH | Channel Number V _{channel} Ne configuration Note1 k configuration Note1 Pattern Id ent bandwidth ence measurement ned in A.3.1.1.2 H allocation H/PHICH Reference channel defined in B.1.2.2 defined in A.3.2.2.1 A.3.2.2.2 (OP.2 TDD) CH_RA CH_RB SS_RA ICH_RB CH_RB CH_RA CH_RB CH_RB CH_RA CH_RB CH_RB CH_RA CH_RB CH_RB CH_RA CH_RB CH_RB CH_RA CH_RB CH_RB CH_RA CH_RB C | Channel Number Vohannel Vohan | Cell 1 Cell 2 | Channel Number Cell 1 Cell 2 Cell 1 |

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 | | st 2 | | | | | |
|--|------------|----------|----------------|----------|----------------|--|--|--|--|--|
| E-UTRA RF Channel Number | | | 1 | 1 | | | | | | |
| BW _{channel} | MHz | | 0 | 10 | | | | | | |
| Gap Pattern Id | IVII IZ | |) | | 0 | | | | | |
| | | , | | | | | | | | |
| 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_RB | dB | 0 | 0 | 0 | 0 | | | | | |
| PDCCH_RA | | | | | | | | | | |
| PDCCH_RB | | | | | | | | | | |
| PDSCH_RA | | | | | | | | | | |
| PDSCH_RB | | | | | | | | | | |
| OCNG_RANote1 | | | | | | | | | | |
| OCNG_RBNote | | | | | | | | | | |
| $N_{oc}^{ m Note2}$ | dBm/15 kHz | -88 | 3.65 | -1 | 04 | | | | | |
| $\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | dB | - | 0 | | 3 | | | | | |
| RSRP ^{Note3} | dBm/15 kHz | -78 | 3.65 | -(| 91 | | | | | |
| lo ^{Note3} | dBm/9 MHz | -50 | .45 | -63 | 3.01 | | | | | |
| \hat{E}_s/N_{oc} | dB | 1 | 0 | 1 | 3 | | | | | |
| Propagation condition | - | AW | 'GN | AW | /GN | | | | | |
| Note 1: OCNG shall be used suc | | | | | | | | | | |

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.9.1.5.2-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

| Parameter | Unit | Test 1 | Test 2 | | | | |
|---|--------------------------------|----------|----------|--|--|--|--|
| E LITE A DE OL . IN . I | | Cell 2 | Cell 2 | | | | |
| E-UTRA RF Channel Number | N 41 1- | 2 | 2 | | | | |
| BW _{channel} | MHz | 10 | 10 | | | | |
| Special subframe configuration Note1 | | 6 | 6 | | | | |
| Uplink-downlink configuration Note1 | | 1 | 1 | | | | |
| Gap Pattern Id | | - | - | | | | |
| Measurement bandwidth | n_{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_RA | dB | 0 | 0 | | | | |
| PDSCH_RA PDSCH_RB OCNG_RA ^{Note2} OCNG_RB ^{Note2} | | | | | | | |
| $N_{oc}^{ m Note3}$ | 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 | | | | |
| lo ^{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 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. | | | | | | | |

Interference from other cells and noise sources not specified in the test is assumed Note 3: 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

| Pa | rameter | Unit | | Test 1 | |
|--|---|------------|--|---|---------------------------|
| | | Onit | Cell 1 | Cell 2 | Cell3 |
| | nannel Number | | 1 | 2 | 2 |
| BW _{channel} | | MHz | 10 | 10 | 10 |
| 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 | - |
| Measurement I | | n_{PRB} | | 6.5.3.1. 22—27 | |
| | ence measurement | PRB | | | |
| channel define | | | R.0 FDD | R.0 FDD | - |
| 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.: A.3.2.1.2 (OP.: | 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_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RANot OCNG_RBNot | e | dB | 0 | 0 | 0 |
| $N_{oc}^{ m Note2}$ | Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F 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 Ch | annel 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 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 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 | | |
| 1 | transmitted power spectra | , | | , | | | |
| Note 2: | Interference from other ce | | | | | | |
| | to be constant over subca | | ia snaii be mo | delled as Avvi | GIN OF | | |
| | appropriate power for $N_{\scriptscriptstyle o}$ | $_{c}$ to be fulfilled. | | | | | |
| Note 3: | RSRP and lo levels have | been derived from other parameters for information | | | | | |
| | purposes. They are not se | | | | | | |
| Note 4: | RSRP minimum requirem | • | assuming ind | dependent inte | erference and | | |
| | noise at each receiver and | • | | | | | |
| Note 5: | The selection of the band aggregation supported by | | nds on the co | nfiguration of t | he carrier | | |
| Note 6: | For Band 26, the tests sha | all be performed w | vith the carrie | r frequency of | the assigned | | |
| | E-UTRA channel bandwic | lth within 865-894 | MHz. | | | | |
| Note 7: | This test verifies the RRM | | | | l bandwidth | | |
| 1 | and is performed according | | | | | | |
| Note 8: | E-UTRA operating band of | groups are as defir | ned in Sectior | า 3.5. | | | |

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 | | |
|---|-------------------------------------|---------------------|----------------------------|---|------------------------------|--|
| Pa | arameter | Unit | Cell 1 | Cell 2 | Cell 3 | |
| E-UTRA RF Channe | el Number | | 1 | , | 2 | |
| BW _{channel} | | MHz | | | | |
| Special subframe co | onfiguration ^{Note1} | | | | | |
| Uplink/downlink con | figuration ^{Note1} | | | 1 | | |
| Timing offset to Cel | 11 | μs | - | 0 | 3 | |
| Time alignment erro | or between cell 2 and cell 1 | | - | ≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1 | - | |
| Measurement band | width | n_{PRB} | | 22—27 | | |
| PDSCH Reference 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/PI | | | R.6 TDD | | | |
| | nel defined in A.3.1.2.2 | | 1 1 | | | |
| 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 PBCH RA | (OP.2 TDD) | | | | | |
| PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RA PDCCH_RA PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB OCNG_RB | | dB | 0 | 0 | 0 | |
| Note3 | Bands TDD_A | | -117 | (N_{oc}) for | Channel 1 | |
| $N_{oc}^{ m Note3}$ | Bands TDD_C | dBm/15 kHz | -116 | | | |
| | Bands TDD_E | | -115 | +10 | dB) | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | | 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 C +5.3 | hannel 1 3dB) | |
| \hat{E}_s/N_{oc} | | dB | -4 | 3 | -1 | |
| Propagation condition | | - | | AWGN | | |
| Note 1: For spec | ial subframe and uplink-dow | nlink configuration | ons see Table | es 4.2-1 and 4 | 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 | | '100000010000001000 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 moderational on 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

| | | 1124 | Tes | st 1 | Tes | st 2 | Tes | st 3 | |
|--|--|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
| | arameter | Unit | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 | |
| | nannel Number | | • | | 1 | | | 1 | |
| BW _{channel} | | MHz | 10 | | 10 | | 10 | | |
| Measurement bandwidth | | $n_{\scriptscriptstyle PRB}$ | 22- | –27 | 22- | -27 | 22- | –27 | |
| | ence measurement | | R.0 | - | R.0 | _ | R.0 | - | |
| channel define | | | FDD | | FDD | | FDD | | |
| PDSCH allocat | | n_{PRB} | 13—36 | - | 13—36 | - | 13—36 | - | |
| | CH/PHICH Reference channel defined in | | R.6 | FDD | R.6 | FDD | R.6 | FDD | |
| OCNG Patterns (OP.5 FDD) an FDD) | s defined in A.3.2.1.5 id A.3.2.1.6 (OP.6 | | OP.5 FDD | OP.6 FDD | OP.5 FDD | OP.6 FDD | OP.5 FDD | OP.6 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 | | uБ | Note 0 | U | Note 0 | 0 | Note 6 | U | |
| 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 | | | | | • | -116 | | |
| | Bands FDD_B |] | | | | | -11 | 5.5 | |
| a z Note 2 | Bands FDD_C | | | | | | | -115 | |
| $N_{oc}^{ m Note2}$ | Bands FDD_D | dBm/15 kHz | -1 | 06 | -88 | | -114.5 | | |
| | Bands FDD_E, FDD_F Note 7 | | | | | | | -114 | |
| | Bands FDD_G Note 9 | | | | | | -113 | | |
| | Bands FDD_H | | | | | | -112.5 | | |
| <u> </u> | | | | | <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 | |
| $(Io)_{meas}^{Note 3}$ | Bands FDD_D | dBm/9 MHz | -71.41 | -74.88 | -53.63 | -57.37 | -80.13 | -83.87 | |
| \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | Bands FDD_E, FDD_F Note 7 | GDIII, O IVII IZ | , ,,,,,, | 7 7.00 | -03.03 | -51.31 | -79.63 | -83.37 | |
| | Bands FDD_G Note 9 | | | | | | -78.63 | -82.37 | |
| | Bands FDD_H | | | | | | -78.13 | -81.87 | |
| Propagation co | ondition | | 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: | 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: | 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. |

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.

E-UTRA operating band groups are as defined in Section 3.5.

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

| Darameter | l lnit | Tes | st 1 | Tes | Test 2 | | Test 3 | |
|---|-------------------|---------------|-------------|-------------|-------------|-------------------------|-------------------------|--|
| Parameter | 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 | | 1 | 0 | |
| 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.3.2.2.1 (OP.1 TDD) and 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 | |
| PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA 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} Note 2 Bands TDD_A Bands TDD_C Bands TDD_E | dBm/15 kHz | -1 | 06 | -8 | 38 | -1 | 16 15 14 | |
| CRS \hat{E}_s/N_{oc} | dB | 5 | -2 | 5 | -4 | 5 | -4 | |
| CRS $(\hat{E}_s/I_{ot})_{meas}$ Note 5 | dB | 2.88 | -2 | 3.54 | -4 | 5 | -4 | |
| SCH \hat{E}_s/I_{ot} | dB | -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 condition | | | 'GN | AW | | | 'GN | |
| Note 1: OCNG shall be used such | that both cells a | re 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 | | '0100000010000001000 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 | | '0001000000100000001 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} | annor rannor | MHz | 10 | | 10 | | 10 | |
| | م مادد بأ ماذاء | | | | 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/PCFICE | H/PHICH Reference | 1 Kb | | | | | | |
| | 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 | FUU | 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 | | | | | | | | |
| 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 | dBm/15 kHz | | | | | - | 5.5 15 |
| Note 2 | Bands FDD_D | | | | -88 | | <u> </u> | 4.5 |
| $N_{oc}^{ m Note~2}$ | | | -1 | 06 | | | | |
| | Bands FDD_E, FDD_F Note 8 | | | | | | -114 | |
| | Bands FDD_G Note | | | | | | 440 | |
| | 10 | | | | | | -1 | 13 |
| | Bands FDD_H | | | | | | -112.5 | |
| CRS \hat{E}_s/N_{oc} | | dB | 5 | -2 | 5 | -4 | 5 | -4 |
| | | QD. | | | 0 | 7 | | 7 |
| $ CRS (\hat{E}_s/Iot)_n $ | Note 5, 7 in the 1 st | dB | 2.88 | -8.19 | 3.54 | 10.10 | 254 | 10.10 |
| OFDM symbol | ieus | uБ | 2.00 | -0.19 | 3.54 | -10.19 | 3.54 | -10.19 |
| | Note 5 : OFDM | | | | | | | |
| | 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 | -57.37 | -79.63 | -83.37 |
| Syllibul | Pondo EDD O Note | | | | | | | |
| | Bands FDD_G Note | | | | | | -78.63 | -82.37 |
| | <u> </u> | | | | | | ļ | |

| | Bands FDD_H | | | | | | -78.13 | -81.87 |
|----------------------|------------------------------|-----------|--------|------------|--------|--------|--------|---------|
| | Bands FDD_A | | | .41 -76.09 | -53.63 | -58.76 | -81.63 | -86.76 |
| | Bands FDD_B | | | | | | -81.13 | -86.26 |
| $(Io)_{meas}$ Note 3 | Bands FDD_C | dBm/9 MHz | | | | | -80.63 | -85.76 |
| in OFDM | Bands FDD_D | | | | | | -80.13 | -85.26 |
| au mala ala atla au | Bands FDD_E, FDD_F Note 8 | | -71.41 | | | | -79.63 | -84.76 |
| | Bands FDD_G Note | | | | | | -78.63 | -83.76 |
| | Bands FDD_H | | | | | | -78.13 | -83. 26 |
| Propagation con | dition | | 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 measurement | | | 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. |
| KE CHAIIIELL | | | 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

| Parameter E-UTRA RF Channel Number | | Unit | Test 1 | | Tes | st 2 | Test 3 | | |
|--|--|-------------|-------------|-------------|-------------|-------------|----------------------------|----------------------------|--|
| | | Unit | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 | |
| - | nel Number | | | - | 1 | | | 1 | |
| BW _{channel} | | MHz | 10 | | 10 | | 10 | | |
| Measurement bar | | n_{PRB} | 22- | –27 | 22- | –27 | 22—27 | | |
| PDSCH Referenc channel defined in | | | R.0 TDD | - | R.0 TDD | - | R.0 TDD | - | |
| PDSCH allocation | 1 | n_{PRB} | 13—36 | - | 13—36 | - | 13— 36 | - | |
| measurement cha A.3.1.2.2 | | | 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 PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB Note1 | | 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 | -8 | 38 | -1 | 16 15 14 | |
| CRS \hat{E}_s/N_{oc} | | dB | 5 | -2 | 5 | -4 | 5 | -4 | |
| CRS $(\hat{E}_s/Iot)_{mea}$ 1st OFDM symbol | | dB | 2.88 | -8.19 | 3.54 | -10.19 | 3.54 | -10.19 | |
| CRS $(\hat{E}_s/Iot)_{mea}$ 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 symbol | Bands TDD_A Bands TDD_C Bands TDD_E | . dBm/9 MHz | -71.41 | -74.88 | -53.63 | -57.37 | -81.63 -80.63 -79.63 | -85.37 -84.37 -83.37 | |
| $(Io)_{meas}^{Note 3}$ in OFDM | Bands TDD_A Bands TDD_C | dBm/9 MHz | -71.41 | -76.09 | -53.63 | -58.76 | -81.63 -80.63 | -86.76 -85.76 | |
| | D TDD E | | 1 | | | | -79.63 | -84.76 | |
| symbols other than the 1 st one Propagation cond | Bands TDD_E | | | 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: | 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: | 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 9.1.2.3 and 9.1.2.4. |
| Note 8: | 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

| Do | | I I m i t | | Test 1 | | |
|---|--|------------------------------|--------------|----------------------------|-----------|--|
| | rameter | Unit | Cell 1 | Cell 2 | Cell 3 | |
| BW _{channel} Note 1 | | MHz | 20 | 20 | 20 | |
| | Measurement bandwidth | | 47—52 | | | |
| PDSCH Refere | ence 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/PCFIC Reference mea defined in A.3. | surement channel | | | 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 | | -84.25 | | | |
| | Bands FDD_C Note 5 | | -83.75 | | | |
| lo ^{Note2} | Bands FDD_D Note 5 | dBm/18 MHz | -83.25 | (Io for Channel 1 +5.33dB) | | |
| | Bands FDD_E Note 5 | | -82.75 | | | |
| | Bands FDD_G Note 5 | | -81.75 | | | |
| | Bands FDD_H | | -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 | |
|--|--|---------------|----------------------------|--------|------------------|
| | Parameter | Unit | Cell 1 | Cell 2 | Cell 3 |
| BW _{channel} Note 1 | | MHz | | 20 | |
| Measurement ban | dwidth | n_{PRB} | 47—52 | | |
| PDSCH Reference defined in A.3.1.1 | e measurement channel 2 | | R.3 TDD R.3 TDD N/A | | |
| PDSCH allocation | | n_{PRB} | 38—61 38—61 N/A | | |
| PDCCH/PCFICH/ measurement cha | PHICH Reference nnel defined in A.3.1.2.2 | | R.10 TDD | | |
| OCNG Patterns d TDD) and A.3.2.2 | efined in A.3.2.2.7 (OP.7 8 (OP.8 TDD) | | OP.7 TDD OP.7 TDD OP.8 T | | |
| lo ^{Note2} | Bands TDD_A Note 5 Bands TDD_C Note 5 Bands TDD_E Note 5 | dBm/18 MHz | -84.75 -83.75 -82.75 | ` | hannel 1 3dB) |
| 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 4: E-UTRA Note 5: The tes | 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. | | | | |

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 res | | 0μs | Synchronous cells |
| Cell 3 time offset with res | pect to | -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 00001000000010000000' | 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 measureme resource restriction patter neighbour cell measurem RF Channel 1 | ents on | '100000010000001000 0000100000001000000' | 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 measuremer resource restriction patter serving cell measuremen | n for | '0100000010000000100 00000100000001000000 | Configured for measurements on Cell 1. |
| CRS physCe | | see PCI conditions above | The CRS assistance information is provided for |
| assistance antenna | aPortsC | 1 | Cell 2 only in CRS-AssistanceInfo. It includes a |
| information ount | | | single MBSFN-SubframeConfig element with |
| mbsfn- Subfrar gList | neConfi | 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

| Dor | omotor. | Unit | | Test 1 | | | Test 2 | | | Test 3 | |
|--|----------------------------------|---------------|-------------|---------|-------------|-------------|-------------|--------|------------------|----------------|---------------|
| | ameter | 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 | | n_{PRB} | | 22—27 | | | 22—27 | 1 | | 22—27 | ı |
| PDSCH Refere | | | R.0 | _ | _ | R.0 | _ | _ | R.0 | _ | _ |
| measurement channel defined in A.3.1.1.1 | | | FDD | | _ | FDD | | | FDD | _ | |
| PDSCH alloca | | n_{PRB} | 13—36 | | - | 13—36 | - | - | 13—36 | - | - |
| PDCCH/PCFIC | | | | 0.0500 | | | D 0 EDD | | | D 0 EDD | |
| Reference mea | | | | R.6 FDD | | | R.6 FDD | | | R.6 FDD | |
| OCNG Pattern | | | 00.5 | OP.6 | OD C | OD 5 | ODC | OP.6 | OD 5 | OD C | OP.6 |
| A.3.2.1.5 (OP. | | | OP.5 FDD | FDD | OP.6 FDD | OP.5 FDD | OP.6 FDD | FDD | OP.5 FDD | OP.6 FDD | FDD |
| A.3.2.1.6 (OP. PBCH_RA | 6 FDD) | | | | | | | | | | |
| PBCH_RB | | | | | | | | | | | |
| PSS_RA | | | | | | | | | | | |
| SSS_RA | | | | | | | | | | | |
| PCFICH_RB PHICH_RA | | | | | | | | | | | |
| PHICH_RB | | dB | Note 6 | Note | 0 | Note 6 | Note 6 | 0 | Note 6 | Note 6 | 0 |
| PDCCH_RA | | | | 6 | | | | | | | |
| PDCCH_RB | | | | | | | | | | | |
| PDSCH_RA PDSCH_RB | | | | | | | | | | | |
| OCNG_RA ^{Note} | OCNG RA ^{Note1} | | | | | | | | | | |
| OCNG_RB ^{Note} | 1 | | | | | | | | | | |
| _ | Bands FDD_A | | | | | | • | • | | -116 | • |
| | Bands FDD_B | , | | | | | | | | -115.5 | |
| n a Note 2 | Bands FDD_C Bands FDD_D | • | | | | | | | | -115 -114.5 | |
| $N_{oc}^{ m Note2}$ | Bands FDD E. | dBm/15 kHz | | -106 | | -88 | | | -114 | | |
| | FDD_F Note 7 Bands FDD_G | KI IZ | <u> </u> | | | | | | | | |
| | Note 9 Bands FDD_H | | | | | | | | | -113 -112.5 | |
| | | ID. | 4 | | 4.5 | | | | | | |
| CRS \hat{E}_s/N_{oc} | Note 5 | dB | 4 | 2 | -1.5 | 4 | 2 | -4 | 4 | 2 | -4 |
| CRS (\hat{E}_{s}/I_{ot}) | | 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 Bands FDD_C | , | | | | | | | -111.5 -111 | -113.5 -113 | 119.5 -119 |
| | Bands FDD_D | | | | | | | | -110.5 | -112.5 | - |
| RSRP Note3,4,5 | Bands FDD F. | dBm/15 kHz | -102 | -104 | - 107.5 | -84 | -86 | -92 | -110 | -112 | 118.5 -118 |
| | FDD_F Note 7 Bands FDD_G Note 9 | N. 12 | | | 107.0 | | | | | | |
| | | | | | | | | | -109 | -111 | -117 - |
| | Bands FDD_H | | | | | | | | -108.5 | -110.5 | 116.5 |
| | Bands FDD_A Bands FDD_B | • | | | | | | | -80.82 -80.32 | -85. -84. | |
| | Bands FDD_B | | | | | | | | -79.82 | -84. | |
| (-) | Bands FDD_D | dBm/9 | | | | | | | -79.32 | -83. | |
| $(Io)_{meas}^{Note 3,5}$ | Bands FDD_E, FDD_F Note 7 | MHz | -70.58 | -74 | .43 | -52.82 | -57. | 04 | -78.82 | -83. | 04 |
| | Bands FDD_G Note 9 | | | | | | | | -77.82 | -82. | 04 |
| | Bands FDD_H | | | | | | | | -77.32 | -81. | 54 |
| Propagation co | ondition | | | 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 on | | 000000001000000001 | to the UE in measSubframePatternNeigh IE in |
| RF Channel 1 | | | measSubframePatternConfigNeigh, as defined |
| I Ki Chameri | | | 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 | 1 | | Configured for Cell 1 measurements. |
| resource restriction pattern for | | '100000000100000000' | January 101 John 1 Modern of Monte 1 |
| serving cell measurements | | | |
| <u> </u> | | | |
| | | | |
| CRS physCellId | + | see PCI conditions above | The CRS assistance information is provided for |
| assistance antennaPortsC | - | 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'. |
| SubframeConfi | | | |
| gList | | | |
| y∟iot | 1 | 1 | 1 |

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

| Davamatar | I I mit | | 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 | | F | 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.5 TDD | OP.6 TDD | OP.6 TDD | OP.5 TDD | OP.6 TDD | OP.6 TDD | OP.5 TDD | OP.6 TDD | OP.6 TDD |
| PBCH_RA PBCH_RB | | | | | | | | | | |
| PSS_RA SSS_RA | \dashv | | | | | | | | | |
| PCFICH_RB | | | | | | | | | | |
| PHICH_RA | | | | | | | | | | |
| PHICH_RB | dB | Note | - 6 | 0 | Not | te 6 | 0 | Not | te 6 | 0 |
| PDCCH_RA | ٦ | 1101 | | | 110 | | | 110 | .0 0 | |
| PDCCH_RB | | | | | | | | | | |
| PDSCH_RA | | | | | | | | | | |
| PDSCH_RB | | | | | | | | | | |
| OCNG_RA ^{Note1} | | | | | | | | | | |
| OCNG_RB ^{Note1} | | | | | | | | | | |
| N _{oc} Note2 Bands TDD_A Bands TDD_C | dBm/15 | | | | | | | | -116 | • |
| | - kHz | | -106 | | | -88 | | | -115 | |
| Bands TDD_E | KI IZ | | | | | | | | -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 |
| Bands TDD_A | dBm/15 | _ | | | _ | _ | | -112 | -114 | -120 |
| RSRP Note3,4,5 Bands TDD_C | ubiii/15 kHz | -102 | -104 | 107.5 | -84 | -86 | -92 | -111 | -113 | -119 |
| Bands TDD_E | NI IZ | | | 107.5 | | | | -110 | -112 | -118 |
| Bands TDD_A | dBm/9 |] | | | | | | -80.82 | -85 | |
| $(Io)_{meas}$ Note 3, 5 Bands TDD_C | MHz | -70.58 | -74 | .43 | -52.82 | -57. | 04 | -79.82 | -84 | |
| Bands TDD_E | IVII IZ | | | | | | | -78.82 | 78.82 -83.04 | |
| Propagation condition | 1 | | AWGN | | | AWGN | : ttl | | 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 | Test 1 | | Test 2 | | Test 3 | |
|--|---|----------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | Offic | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| | Channel Number | | • | - | • | - | | 1 |
| BW _{channel} | | MHz | Į. | 5 | | 5 | 5 | |
| Measurement | bandwidth | n_{PRB} | 10- | –15 | 10—15 | | 10—15 | |
| | PDSCH Reference measurement channel defined in A.3.1.1.1-1 | | R.5 FDD | - | R.5 FDD | - | R.5 FDD | - |
| PDSCH alloca | | n_{PRB} | 7—17 | - | 7-17 | - | 7-17 | - |
| | CH/PHICH Reference channel defined in | | R.11 | FDD | R.11 | FDD | R.11 | FDD |
| A.3.2.1.16 (O | 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 PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB | PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA ^{Note1} | | 0 | 0 | 0 | 0 | 0 | 0 |
| $N_{oc}^{ m Note2}$ | Bands FDD_N | dBm/15 kHz | -1 | 03 | -8 | 33 | -10 | 9.5 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | | 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 | 3.94 |
| \hat{E}_s/N_{oc} | | dB | 6 | 1 | 6 | 1 | 3 | -1 |
| Propagation of | ondition | - | AW | 'GN | AW | 'GN | AW | 'GN |
| Note 1: OC | NG shall be used such ectral density is achieved | | | cated and | a constant | total trans | mitted pov | ver |
| | ectral density is achieved | | | acified in t | ha tast is a | secumed to | ha const | ant over |

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.9.1.16.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.2.1 and 9.1.2.2.

Note 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

| D- | Danamatas Test 1 | | st 1 | Tes | st 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 | | $n_{\scriptscriptstyle PRB}$ | 10– | –15 | 10– | –15 |
| PDSCH Refere | ence measurement d in A.3.1.1.1 | | R.5 FDD | - | R.5 FDD | - |
| PDSCH allocat | tion | $n_{\scriptscriptstyle PRB}$ | 7—17 | - | 7-17 | - |
| defined in A.3. | asurement channel 1.2.1 | | 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 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | | dB | 10 | 10 | 13 | -4 |
| RSRP ^{Note3} | Cell 2: Bands FDD_N | dBm/15 kHz | -75.65 | -75.65 | -89.5 | -114.5 |
| Io ^{Note3} | Cell 2: Bands FDD_N | dBm/4.5 MHz | -50.46 | -50.46 | -64.52 | -84.27 |
| \hat{E}_s/N_{oc} | \hat{E}_s/N_{oc} | | 10 | 10 | 13 | -4 |
| Propagation con- | | - | AW | | | GN |
| Note 1: OCN | JC chall be used suc | h that both calls a | مالم براليد | aatad aad | a aanatant | 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.

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.

Table A.9.1.17.2-1: Void

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- | Devenuetes | | 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 | | | |
| $N_{oc}^{$ | Bands FDD_C | dBm/15 kHz | -116 | | | |
| | Bands FDD_D | | -115.5 | | | |
| | Bands FDD_E, FDD_F | | -115 | (N_{oc} for Channel 1 +10 | | |
| | Bands FDD_G | | -114 | | | |
| | Bands FDD_H | | -113.5 | | | |
| | Bands FDD N | | N/A | | | |
| | Bands FDD_A | | -121 | | | |
| | Bands FDD_B | | -120.5 | | | |
| | Bands FDD_C | | -120 | | | |
| | Bands FDD_D | | -119.5 | (RSRP for | (RSRP for | |
| RSRP ^{Note2} | Bands FDD_E, FDD_F | dBm/15 kHz | -119 | Cell 1 +8dB) | Cell 1 +4dB) | |
| | Bands FDD_G | _ | -118 | +oub) | +4ub) | |
| | 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 | | | |
| | Bands FDD_C | _ | -86.26 | | | |
| | Bands FDD_E, | dBm/9 MHz | -00.20 | N | /A | |
| | 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 | (10 101 Chann | el 1 +2.32dB) | |
| | FDD_F | | | | | |
| | Bands FDD_G |] | | | | |
| | Bands FDD_H |] | | | | |
| | 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.

A.9.1.18.3 Test Requirements

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

| | Parameter | Unit | | Test 1 | | |
|----------------------------------|--|---------------|----------|------------|--------------|--|
| | Parameter | Unit | Cell 1 | Cell 2 | Cell 3 | |
| BW _{channel} Note 1 | | MHz | 10 | 5 | 5 | |
| Measurement b | andwidth | $n_{\it PRB}$ | 22-27 | 10-15 | | |
| PDSCH Reference defined in A.3.1 | nce measurement channel .1.2 | | R.0 TDD | R.5 TDD | N/A | |
| PDSCH allocati | on | n_{PRB} | 13-36 | 7-17 N/A | | |
| | H/PHICH Reference hannel defined in A.3.1.2.2 | | R.6 TDD | R.11 TDD | | |
| OCNG Patterns A.3.2.2 (TDD) | defined in | | OP.1 TDD | OP.9 TDD | OP.10 TDD | |
| | Bands TDD_A | | -87.76 | | | |
| | Bands TDD_C | dBm/9 MHz | -86.76 | N/A | | |
| Io ^{Note2} | Bands TDD_E | | -85.76 | | | |
| lo ^{Note} | Bands TDD_A | | | (la far Cl | annal 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

| Par | ameter | Unit | | Test 1 | | |
|---|-----------------------------------|-------------------|----------|--------------------|-----------------|--|
| | | | Cell 1 | Cell 2 | Cell 3 | |
| BW _{channel} Note 1 | | MHz | 5 | 5 | 5 | |
| Measurement b | | n_{PRB} | 10-15 | 10-15 | 10-15 | |
| PDSCH Refere | nce measurement I in A.3.1.1.1 | | R.0 FDD | R.5 FDD | N/A | |
| PDSCH allocati | on | n_{PRB} | 7-17 | 7-17 | - | |
| PDCCH/PCFIC | | | | | | |
| Reference measurement channel | | | R.11 FDD | R.11 FDD | R.11 FDD | |
| defined in A.3.1 OCNG Patterns | | | | | | |
| A.3.2.1.15 (OP. | | | OP.15 | OP.15 | OP.16 FDD | |
| A.3.2.1.26 (OP. | | | FDD | FDD | 01.10100 | |
| 7.10.220 (0 | 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, | dBm/15 kHz | -115 | (N_{oc} for Cha | annel 1 +1dB) | |
| | FDD_F Bands FDD_G | | -114 | | | |
| | Bands FDD_G Bands FDD_H | | -113.5 | | | |
| | Bands FDD_N | - | -110.5 | | | |
| | Bands FDD_A | | -121 | | | |
| | Bands FDD_B | 1 | -120.5 | | | |
| | Bands FDD_C | | -120 | | | |
| | Bands FDD_D | | -119.5 | (RSRP for | (RSRP for | |
| RSRP ^{Note2} | Bands FDD_E, FDD_F | dBm/15 kHz | -119 | Cell 1 +8dB) | Cell 1 +4dB) | |
| | Bands FDD_G | | -118 | Toub) | +4ub) | |
| | Bands FDD_H | - | -117.5 | | | |
| | Bands FDD_N | - | -114.5 | | | |
| | Bands FDD A | | | | JI. | |
| | 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 | dBm/4.5 MHz | -89.26 | (In for Chann | el 1 +5.33dB) | |
| 10 | Bands FDD_E, FDD_F Note 5 | dbiii/4.5 ivii iz | -88.76 | (10 101 Chanii | lei i +5.55ub) | |
| | Bands FDD_G Note 5 | | -87.76 | | | |
| | Bands FDD_H Note 5 | | -87.26 | | | |
| | Bands FDD_N Note 5 | | -84.26 | | | |
| | test verifies the RRM | | | | l bandwidth | |
| | s performed accordi | | | | nation | |
| Note 2: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | nauun | |
| | | | | | | |
| | · · | | | | | |
| | | | | | | |
| | orting 5MHz + 5MHz | | | | | |

Test Requirements

A.9.1.20.3

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 | |
| Io ^{Note2} Bands TDD_A Note 5 Bands TDD_C Note 5 Bands TDD_E Note 5 | dBm/4.5MHz | -90.76 -89.76 (lo 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 5MHz + 5MHz channel bandwidth. | | | | | |

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 |
| | NI/DUICH | | 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 | | - 117.5 | (RSRP for | | |
| | Bands TDD_C | | | Cell 1 | (RSRP for | |
| | Bands TDD_E | | | +8dB) | Cell 1 +4dB) | |
| | Danus TDD_E | | -87.76 + | +oub) | | |
| | Bands FDD_A | | 10log(N _{RB,} √50) | | - | |
| | Bands FDD_B | | -87.26 + 10log(N _{RB,} | | - | |
| | Bands FDD_C | | -86.76+ 10log(N _{RB,} _/50) | | - | |
| lo ^{Note3} | Bands FDD_D | dBm/ BW _{channel} | -86.26+ 10log(N _{RB,} √50) | | - | |
| | Bands FDD_E, FDD_F Note 6 | CIDITI/ DVV channel | -85.76+ 10log(N _{RB,} √50) | - | | |
| | Bands FDD_G | | -84.76+ 10log(N _{RB,} √50) | - | | |
| | Bands FDD_H | | -84.26+ 10log(N _{RB,} √50) | - | | |
| | Bands TDD_A | | - | (Io for Channel 1 +5.33dB | | |
| | Bands TDD_C | | - | | 0log | |
| | Bands TDD_E | | - | (N _{RB channel2} / N _{RB channel 1})) | | |
| Propagation c | | - | AWGN | AWGN | AWGN | |
| Antenna Conf | guration | - | 1x2 | 1x2 | 1x2 | |
| Timing offset t | o cell 1 | μs | - | 0 | 3 | |
| Time alignment cell 1 Note 8 | nt error relative to | - | - | ≤TAE | - | |
| Note 1: For | special subframe and S 36.211. | uplink-downlink o | onfigurations | see Tables 4. | 2-1 and 4.2-2 | |
| Note 2: OC | NG shall be used such smitted power spectra | | | | nt total | |
| Note 3: Inte | erference from other cope constant over subca | ells and noise sou | rces not spec | ified in the test | | |
| | propriate power for to | | ia dilaii de ille | aciica as AVV | 0.4 0. | |
| Note 4: Es/ | lot, RSRP and lo level poses. They are not s | ls have been deriv | | | or information | |
| Note 5: RS | | | | | | |
| Note 6: The | selection of the band | ls for testing depe | nds on the co | nfiguration of t | he carrier | |
| Note 7: For | aggregation supported by the UEs. 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: Tim | ie alignment error (TA ue depends upon the t | E) as specified in | TS 36.104 [30 | 0] clause 6.5.3 | .1. The TAE | |
| | JTRA operating band o | | | า 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

| Parameter | | Unit | | Test 1 | |
|--|---|---------------|--|--|--|
| | | Onit | Cell 1 | Cell 2 | Cell3 |
| E-UTRA RF Ch | annei Number | | 1 5MHz: | 2 | 2 |
| BW _{channel} | | | N _{RB,c} = 25 10MHz: N _{RB,c} = 50 20MHz: N _{RB,c} = 100 | 5MHz: $N_{\text{RB,c}} = 25$ 10MHz: $N_{\text{RB,c}} = 50$ 20MHz: $N_{\text{RB,c}} = 100$ | $\begin{array}{l} \text{5MHz: N}_{\text{RB,c}} \\ = 25 \\ \text{10MHz:} \\ \text{N}_{\text{RB,c}} = 50 \\ \text{20MHz:} \\ \text{N}_{\text{RB,c}} = 100 \end{array}$ |
| Special subfran | ne | | | | |
| configuration Not | e1 | | 6 | - | - |
| Uplink-downlink | configuration ^{Note1} | | 1 | - | - |
| Measurement b | andwidth | $n_{\it PRB}$ | 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 |
| | nce measurement d in A.3.1.1.1 and | | 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 allocati | ion | $n_{\it PRB}$ | 5MHz: 7- 17 10MHz: 13-36 20MHz: 38-61 | 5MHz: 7- 17 10MHz: 13-36 20MHz: 38-61 | - |
| | H/PHICH surement channel .2.1 and A.3.1.2.2 | | 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 |
| | FDD), A.3.2.2.1 ad A.3.2.1.2 (OP.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 |
| $N_{oc}^{$ | Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 9 Bands FDD_G Bands FDD_G Bands FDD_H | dBm/15 kHz | - - - - - | (N_{oc} for Ch | annel 1 +1dB) |
| | Bands TDD_A Bands TDD_C | | -117 -116 | | <u>-</u> - |
| | Bands TDD_E | | -115 | | - |
| \hat{E}_s/N_{oc} | , | dB | -4 | 3 | -1 |
| $\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | | | | | |
| $\mathbf{E}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | | dB | -4 | 0.46 | -5.76 |
| RSRP Note 4 | Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D | dBm/15 kHz | - | (RSRP for Cell 1 +8dB) | (RSRP for Cell 1 +4dB) |

| | | | 1 | ı | |
|--|---|-----------------------------|-------------------------|------------------|---------------------------------------|
| | Bands FDD_E FDD_F Note 9 | Ξ, | - | | |
| | 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 |
| | | N_{cc} | | | |
| Note 4: | appropriate power for N_{oc} to be fulfilled. Note 4: Es/lot, RSRP and lo levels have been derived from other parameters for information | | | | |
| Note 4: | | | | | or information |
| Note 5: | purposes. They are no | | | | rforonce and |
| Note 5. | ote 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | |
| Note 6 | 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 | | | 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 defined in A.3.2.2 (TDD) | | | OP.7 TDD | OP.1 TDD | OP.2 TDD |
| | Bands TDD_A | | -84.76 | 6 N/A | |
| | Bands TDD_C | dBm/18 MHz | -83.76 | | |
| Io ^{Note2} | Bands TDD_E | | -82.76 | | |
| 10 | Bands TDD_A | | | (In for C | hannel 1 |
| | Bands TDD_C | dBm/9MHz | N/A | (lo for Channel 1 +2.33dB) | |
| | Bands TDD_E | | | +2.0 | Jub) |
| 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 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

| Cell 1 Cell 2 | Parameter | | l lait | Test 1 | |
|---|--|--------------------|------------------------------|--------|--------|
| BW_channel MHz | Parameter | | Unit | | |
| Measurement bandwidth | | annel Number | N.41.1 | | • |
| DTMC period ms | | | MHZ | | _ |
| DTMC period offset Discovery signal occasion duration ms N/A 1 1 | | andwidth | n_{PRB} | | –27 |
| Discovery signal occasion duration ms N/A 1 | | | ms | | |
| Disch Reference measurement channel defined in A.3.1.1.1 | | | | | |
| PDSCH Reference measurement channel defined in A.3.1.1.1 | | | | | |
| Channel defined in A.3.1.1.1 | | | μο | | .5 |
| PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 | | | | _ | - |
| PDCCH/PCFICH/PHICH Reference measurement channel defined in | | | $n_{\scriptscriptstyle PPR}$ | 13—36 | - |
| R.6 FDD | PDCCH/PCFIC | H/PHICH Reference | TKD | | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD) | | | | R.6 | FDD |
| OP.1 FDD and A.3.2.1.2 (OP.2 FDD | | | | | |
| FDD | | | | OP.1 | OP.2 |
| PBCH_RA | | d A.3.2.1.2 (OP.2 | | FDD | FDD |
| PBCH_RB | | | | | |
| SSS_RA | | |] | | |
| PCFICH_RB | | |] | | |
| PHICH_RA | | | | | |
| PHICH_RB | | | <u> </u> | | |
| PDCCH_RA | | | dB | 0 | 0 |
| PDCCH_RB | | | i db | U | U |
| PDSCH_RA | | | | | |
| OCNG_RB^Note1 | | |] | | |
| DCNG_RBNote1 Bands FDD_A | PDSCH_RB | PDSCH_RB | | | |
| 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_D Bands FDD_D Bands FDD_E FDD_F Bands FDD_B Bands FD | OCNG_RANOTE1 | | 1 | | |
| Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E FDD_F Bands FDD_G 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_D Bands FDD_D Bands FDD_D Bands FDD_B Ba | OCNG_RB | Randa EDD A | | | |
| Bands FDD_C | | _ | - | | |
| Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H \$\hat{E}_s/I_{ot}\$ | | | 1 | | |
| Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H \$\hat{E}_s/I_{ot}\$ | $N_{oc}^{\rm Note2}$ | Bands FDD_D | dBm/15 kHz | -106 | -106 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | Bands FDD_E, | ubili/15 KHZ | | -106 |
| Bands FDD_H dB 2.5 -6 | | FDD_F Note 7 | - | | |
| Ês/Iot dB 2.5 -6 RSRPNote3 Bands FDD_A 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_C Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_E, FDD_F Note 5 FDD_F Note 5 dBm/9 MHz -70.27 -70.27 | | | - | | |
| Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E FDD_F Note 5 Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_E FDD_F Note 5 Bands FDD_E FDD_F Note 5 Bands FDD_E FDD_F Note 5 FDD_F Note 5 Bands FDD_B Bands FDD_B Bands FDD_E FDD_F Note 5 Bands FDD_B Bands | f: /r | Danus i DD_ii | ID. | 0.5 | |
| RSRP ^{Note3} Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_E, FDD_F Note 5 FDD_F Note 5 Bands FDD_E, FDD_F Note 5 Bands FDD_E, FDD_F Note 5 Bands FDD_E FDD_F Note 5 FDD_F NOTE | $\mathbf{E}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | | ав | 2.5 | -6 |
| RSRP ^{Note3} Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_E, FDD_F Note 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 FDD_F NOTE 5 | | | | | |
| RSRP ^{Note3} Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_B ABN/9 MHz -70.27 Comparison of the co | | | - | | |
| Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 7 Bands FDD_H | Notes | | - | | |
| FDD_F Note 5 | RSRP ^{Note3} | Bands FDD F | dBm/15 kHz | -100 | -105 |
| Bands FDD_H Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F FDD_F Note 5 FDD_E Abnds FDD_E FDD_F FD | | FDD F Note 5 | | | |
| Bands FDD_A Bands FDD_B Bands FDD_C | | Bands FDD_G Note 7 | | | |
| Bands FDD_B Bands FDD_C Io ^{Note3} Bands FDD_D Bands FDD_E, FDD_F | | | | | |
| Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_C dBm/9 MHz -70.27 -70.27 | | | | | |
| lo ^{Note3} Bands FDD_D Bands FDD_E, FDD_F Note 5 dBm/9 MHz -70.27 -70.27 | lo ^{Note3} | _ | - | | |
| Bands FDD_E, FDD_F Note 5 | | | | | |
| | | Bands FDD E. | dBm/9 MHz | -70.27 | -70.27 |
| - Noto 7 | | FDD_F Note 5 | | | |
| | | Bands FDD_G Note 7 | | | |
| Bands FDD_H | | Bands FDD_H | | | |
| \hat{E}_s/N_{oc} dB 6 1 | \hat{E}_s/N_{oc} | | dB | 6 | 1 |
| Propagation condition - AWGN | | ndition | - | 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. |
| 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.9.1.25.3 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 | ameter | Unit | Te: | st 1 Cell 2 |
|--|--------------------------------|-----------------|--------|----------------|
| E-UTRA RF Ch | annel Number | | | 1 |
| BW _{channel} | annor rannor | MHz | | 0 |
| Special subfran | ne | | | |
| configuration Not | configuration ^{Note1} | | · · | 6 |
| Uplink/downlink | configuration Note1 | | , | 1 |
| | Measurement bandwidth | | 22- | –27 |
| DTMC period | | ms | N/A | 160 |
| DTMC period offset | | | N/A | 10 |
| | al occasion duration | ms | N/A | 2 |
| Time offset bety | | μs | | .3 |
| | nce measurement | | R.0 | _ |
| channel defined in A.3.1.1.2 | | | TDD | |
| PDSCH allocati | | n_{PRB} | 13—36 | - |
| PDCCH/PCFIC | | | | |
| | surement channel | | R.6 | TDD |
| | defined in A.3.1.2.2 | | | |
| OCNG Patterns | | | OP.1 | OP.2 |
| A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD) | | | TDD | TDD |
| | (טטו) | | | |
| PBCH_RA | | | | |
| PBCH_RB PSS_RA | | | | |
| SSS_RA | | | | |
| PCFICH_RB | | | | |
| PHICH_RA | | | | |
| PHICH_RB | | dB | 0 | 0 |
| PDCCH_RA | | иБ | | O |
| PDCCH_RB | | 4 | | |
| PDSCH_RA | | | | |
| PDSCH_RB | | | | |
| OCNG_RA ^{Note2} | | | | |
| OCNG_RB ^{Note2} | | | | |
| | Bands TDD_A | | | |
| $N_{oc}^{ m Note3}$ | Bands TDD_A Bands TDD_C | dBm/15 kHz | -106 | -106 |
| | Bands TDD_C | dDIII/13 KHZ | -100 | -100 |
| \hat{E}_{s}/I_{ot} | Danus IDD_L | dB | 2.5 | -6 |
| s / ot | Bands TDD A | | - | - |
| RSRP ^{Note4} | Bands TDD_A Bands TDD_C | dBm/15 kHz | -100 | -105 |
| KOKP | Bands TDD_E | UDIII/ 13 KI IZ | -100 | -105 |
| | | | | |
| lo ^{Note4} | Bands TDD_A | -ID /O MAL! | 70.07 | 70.07 |
| 10.13. | Bands TDD_C | dBm/9 MHz | -70.27 | -70.27 |
| | Bands TDD_E | | | |
| \hat{E}_s/N_{oc} | | dB | 6 | 1 |
| Propagation co | 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 |
| | 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

| Parameter | | Unit | Test 1 | |
|--|------------------------------|------------------|------------------------|---------|
| | | Onit | Cell 1 | Cell 2 |
| E-UTRA RF Ch | annel Number | | 1 | 2 |
| BW _{channel} | | MHz | 10 | 10 |
| Gap Pattern Id | | | 0 | - |
| gapOffset | | ms | 9 | 160 |
| DMTC period | ffcot | ms | - | 160 |
| DMTC period offset Discovery signal occasion duration | | ms ms | - | 10 1 |
| Time offset between cells | | μs | - | 3 |
| Measurement b | | • | 22- | |
| | nce measurement | n_{PRB} | | -21 |
| channel defined | | | R.0 FDD | - |
| PDSCH allocati | | $n_{{\it PRB}}$ | 13—36 | - |
| PDCCH/PCFIC | | | | |
| | surement channel | | R.6 I | -DD |
| defined in A.3.1 | | | | |
| OCNG Patterns A.3.2.1.1 (OP.1 | | | OP.1 | OP.2 |
| A.3.2.1.1 (OP.1 A.3.2.1.2 (OP.2 | | | FDD | FDD |
| 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 | Bands FDD_A | | | -115 |
| | Bands FDD_B | | | -114.5 |
| | Bands FDD C | | | -114 |
| A 7 Note? | Bands FDD D | | (N_{oc} for | -113.5 |
| $N_{_{OC}}^{^{\mathrm{Note2}}}$ | Bands FDD F | dBm/15 kHz | | |
| | FDD_F Note 5 | G.Z, 10 | Channel 2 +6dB) | -113 |
| | Bands FDD_G | | | 112 |
| | Note / | | | -112 |
| Ê/I | Bands FDD_H | ٩D | 40 | -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 | | (5.55- | -120 |
| RSRP ^{Note3} | Bands FDD_D | dBm/15 LU- | (RSRP for | -119.5 |
| KOKP | Bands FDD_E, FDD_F Note 5 | dBm/15 kHz | Cell 2 +25dB) | -119 |
| | Bands FDD G | | . 2005) | |
| | Note 7 | | | -118 |
| | Bands FDD_H | | | -117.5 |
| | Bands FDD_A | | | -86.25 |
| lo ^{Note3} | Bands FDD_B | | | -85.75 |
| | Bands FDD_C | | | -85.25 |
| | Bands FDD_D | alDino (C. NALLa | (lo for | -84.75 |
| 10 | Bands FDD_E, FDD_F Note 5 | dBm/9 MHz | Channel 2 +19.68dB) | -84.25 |
| | Bands FDD_G | | | -83.25 |
| | Bands FDD_H | | | -82.75 |

| \hat{E}_s/N_{oc} | | dB | 13 | -6 | | |
|---|---|-------------------|-----------------|-----------------------|--|--|
| Propagation | on 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: | 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 AWO | GN of appropriate | e power for | v _{oc} to be | | |
| Note 3: | fulfilled. | | | | | |
| Note 4: | RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | |
| Note 5: | | | | | | |
| Note 6: | E-UTRA operating band groups are as defined in Section 3.5. Except Band 29 and Band 32. | | | | | |
| Note 7: Note 8: | DMTC is provided to the UE the beginning of the test | | nfig (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

| Parameter | | Unit | Test | |
|---|--|------------|-----------------------------------|--------|
| | | Onit | Cell 1 | Cell 2 |
| E-UTRA RF Ch | nannel Number | | 1 | 2 |
| BW _{channel} | | MHz | 10 | 10 |
| Special subfrar configuration No | ne e1 | | 6 | |
| I Inlink-downlin | c configuration Note1 | | 1 | |
| Gap Pattern Id | Configuration | | 0 - | |
| gapOffset | | ms | 9 | |
| DMTC period | | ms | - | 160 |
| DMTC period of | ffset | ms | - | 10 |
| Discovery signa | al occasion duration | ms | - | 2 |
| Time offset bet | ween cells | μs | - | 3 |
| Measurement b | pandwidth | n_{PRB} | 22—27 | |
| | PDSCH Reference measurement channel defined in A.3.1.1.2 | | R.0 TDD | - |
| PDSCH allocat | ion | n_{PRB} | 13—36 | - |
| PDCCH/PCFIC | | | | |
| Reference mea defined in A.3.1 | surement channel | | R.6 TDD | |
| OCNG Patterns | | | | |
| A.3.2.2.1 (OP.1 | TDD) and | | OP.1 TDD | OP.2 |
| A.3.2.2.2 (OP.2 | 2 TDD) | | | TDD |
| PBCH_RA | | | | |
| PBCH_RB | | | | |
| PSS_RA | | | | |
| SSS_RA | | | | |
| PCFICH_RB | | | | |
| PHICH_RA PHICH_RB | | dB | 0 0 | 0 |
| PDCCH_RA | | uБ | | O |
| PDCCH_RB | | | | |
| PDSCH_RA | | | | |
| PDSCH RB | | | | |
| OCNG_RA ^{Note2} | | | | |
| OCNG_RB ^{Note2} | | | | |
| | Bands TDD_A | dBm/15 kHz | (N_{oc} for Channel 2 +6dB) | -115 |
| $N_{oc}^{ m Note3}$ | Bands TDD_C | | | -114 |
| | Bands TDD_E | | | -113 |
| \hat{E}_{s}/I_{ot} | | dB | 13 | -6 |
| RSRP ^{Note4} | Bands TDD_A | dBm/15 kHz | (RSRP for Cell 2 +25dB) | -121 |
| | Bands TDD_C | | | -120 |
| | Bands TDD_E | | | -119 |
| | Bands TDD_A | dBm/9 MHz | (lo for Channel 2 +19.68dB) | -86.25 |
| Io ^{Note4} | Bands TDD_C | | | -85.25 |
| | Bands TDD_E | | | -84.25 |
| \hat{E}_s/N_{oc} | | dB | 13 | -6 |
| Propagation condition | | - | AWGN | |
| Note 1: For special subframe and uplink-downlink configurations see | | | | 999 |

Note 1: 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 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 |

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

| D | | 1111 | Test 1 | |
|---|--|------------|---------------------|---------------------|
| Parameter | | Unit | Cell 1 | Cell 2 |
| E-UTRA RF Ch | nannel Number | | 1 | |
| BW _{channel} | | MHz | 10 | |
| DMTC period | " | ms | 16 | |
| DMTC period o | | ms | 10 | |
| | al occasion duration | ms | 1 | |
| CSI-RS resource | ce configuration | mo | 2 | 4 |
| CSI-RS periodi | | ms ms | 10 0 | |
| CSI-RS individu | | dB | 0 | 0 |
| CSI-RS muting | | 32 | Enable | Enable |
| Time offset bet | | μs | - | 2.3 |
| Measurement b | pandwidth | n_{PRB} | 22—27 | |
| PDSCH Refere | ence measurement | | R.0 FDD | - |
| PDSCH allocat | | n_{PRB} | 13—36 | _ |
| | | PKB | . 3 00 | |
| PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 | | | R.6 FDD | |
| A.3.2.1.1 (OP.1 | OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and | | OP.1 FDD | OP.2 FDD |
| A.3.2.1.2 (OP.2 | PFDD) | | . 00 | |
| PBCH_RA | | | | |
| PBCH_RB | | | | |
| PSS_RA SSS_RA | | | | |
| PCFICH_RB | | | | |
| PHICH_RA | | | 0 | 0 |
| PHICH_RB | | dB | | |
| PDCCH_RA | | | | |
| PDCCH_RB | | | | |
| PDSCH_RA | | | | |
| PDSCH_RB | | | | |
| OCNG_RA ^{Note1} | | | | |
| OCNG_RB ^{Note1} | | | _ | _ |
| p-C-r10[2] | T | dB | 6 | 6 |
| | Bands FDD_A | | -116 | |
| | Bands FDD_B Bands FDD_C | | -115.5 | |
| | Bands FDD_C Bands FDD_D | dBm/15 kHz | -115 114.5 | |
| $N_{oc}^{ m Note2}$ | Bands FDD_B | | -114.5 | |
| | FDD_F Note 5 | | -114 | |
| | Bands FDD_G | | -113 | |
| | Bands FDD H | | -112.5 | |
| $CRS \hat{E}_{s}/I_{ot}$ | | dB | 0.46 | -5.76 |
| CSI-RS $\hat{\mathbf{E}}_{s}/\mathbf{I}_{\mathrm{ot}}$ | | dB | 6.46 | 0.24 |
| s / 2 of | 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 | -111.5 | -115.5 |
| | Bands FDD_E, FDD_F Note 5 | | -111 | -115 |
| | Bands FDD_G Note 7 | | -110 | -114 |
| | Bands FDD_H | | -109.5 | -113.5 |
| | Bands FDD_A | | | |
| CSI-RSRP Note3 | Bands FDD_B | dBm/15 kHz | (RSRP for Cell 1 | (RSRP for Cell 2 |
| COLKOKY | Bands FDD_C | | +6dB) | +6dB) |
| | Bands FDD_D | | . 005) | . 000) |

| | 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 | |
| | 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 | \hat{E}_s/N_{oc} | dB | 9 | 5 |
| Propagation | on condition | - | AWGN are fully allocated and a | |
| Note 2: | 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: 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. | | | | |
| Note 6: | E-UTRA operating band groups are as defined in Section 3.5. | | | |
| Note 7: | | | | |
| Note 8: | DMTC is provided to the UE in the <i>measDS-Config</i> (in TS36.331) before the beginning of the test | | | |

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 | | Unit | Test 1 | |
|---|---|------------|------------------|-------------|
| Parameter | | Offic | Cell 1 Cell 2 | |
| | hannel Number | | 1 | |
| BW _{channel} | Note1 | MHz | 10 | |
| Special subfram | e configuration Note1 | | 6 | |
| | configuration Note1 | | 1 | |
| DMTC period | -#+ | ms | 160 | |
| DMTC period | | ms | 10 | |
| | nal occasion duration rce configuration | ms | 2 | |
| CSI-RS resour | | mo | | 4 |
| CSI-RS subfra | | ms ms | 10 0 | |
| CSI-RS individ | | dB | 0 0 | |
| CSI-RS muting | | ub_ | Enable | Enable |
| Time offset be | | μs | - | 2.3 |
| Measurement | | n_{PRB} | 22—27 | |
| | ence measurement | PRB | | |
| channel define | | | R.0 TDD | - |
| PDSCH alloca | | n_{PRB} | 13—36 | - |
| PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 | | | R.6 TDD | |
| OCNG Pattern A.3.2.2.1 (OP. A.3.2.2.2 (OP. | 1 TDD) and | | 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_RB OCNG_RA OCNG_RB POCNG_RB | | dB | 0 | 0 |
| p-C-r10[2] | 1 | dB | 6 | 6 |
| λ/ Note3 | Bands TDD_A | | -11 | |
| $N_{oc}^{ m Note3}$ | Bands TDD_C | dBm/15 kHz | -115 | |
| . , | Bands TDD_E | | -1 ⁻ | 14 |
| ${\sf CRS}\hat{E}_{_{s}}/I_{_{ m ot}}$ | | dB | 0.46 | -5.76 |
| CSI-RS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{c}}}$ | | dB | 6.46 | 0.24 |
| | Bands TDD_A | | -113 | -117 |
| RSRP ^{Note3} | Bands TDD_C | dBm/15 kHz | -112 | -116 |
| | Bands TDD_E | | -111 | -115 |
| CSI-RSRP Note3 | Bands TDD_A | dBm/15 kHz | (RSRP | (RSRP |
| | Bands TDD_C Bands TDD_E | | for Cell 1 | for Cell 2 |
| | Bands TDD_E Bands TDD_A | | +6dB) +6dB) | |
| lo ^{Note3} | Bands TDD_C | dBm/9 MHz | -82.43 -81.43 | |
| 10 | Bands TDD_E | | -80 | |
| | | | | 3 |
| CRS \hat{E}_s/N_{oc} | | dB | 3 | -1 |
| CSI-RS \hat{E}_s/N_{oc} | | dB | 9 | 5 |
| Propagation con | | | AWGN | |
| Note 1: For special subframe and uplink-downlink configurations see | | | | |

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

| Parameter | | 11 | Init Test 1 | |
|--|--|-----------------|--------------------------------|--|
| | | Unit | Cell 1 | Cell 2 |
| E-UTRA RF Ch | annel Number | | 1 | 2 |
| BW _{channel} | | MHz | 10 | 10 |
| Gap Pattern Id | | | 0 | - |
| gapOffset | | ms | 9 | 4.00 |
| DMTC period | tt 1 | ms | 160 | 160 |
| DMTC period offset Discovery signal occasion duration | | ms | 0 | 10 |
| CSI-RS resource | | ms | 2 | <u>1</u> 4 |
| CSI-RS resource | Ŭ | mc | | 0 |
| CSI-RS periodi | | ms | (| |
| CSI-RS individu | | ms dB | 0 | 0 |
| CSI-RS muting | iai onsci[z] | uВ | Enable | Enable |
| Time offset bety | veen cells | μs | - | 3 |
| Measurement b | | n_{PRB} | 22- | |
| | nce measurement | PRB | | |
| channel defined | | | R.0 FDD | - |
| PDSCH allocati | - | $n_{{\it PRB}}$ | 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 Note1 | | dB | 0 | 0 |
| p-C-r10[2] | | dB | 0 | 6 |
| N_{oc} Note2 | 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 |
| CRS $\hat{	ext{E}}_{	ext{	iny s}}/	ext{	iny I}_{	ext{	iny ot}}$ | | dB | 13 | -6 |
| CSI-RS \hat{E}_{s}/I_{ot} | | dB | 13 | 0 |
| 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 | (RSRP for Cell 2 +25dB) | -121 -120.5 -120 -119.5 -119 -118 -117.5 |

| | | Bands FDD_A | dBm/15 kHz | (RSRP for Cell 1 | (RSRP for Cell 2 | | |
|---------------------|--|------------------------------|-------------------|------------------------|---------------------|--|--|
| | | Davida EDD, D | | +0dB) | +6dB) | | |
| | | Bands FDD_B | | | | | |
| | Ness | Bands FDD_C | | | | | |
| CSI-RSRF |) Motes | Bands FDD_D | | | | | |
| | | 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 | 1 | | -85.25 | | |
| | | Bands FDD_D | 1 | (lo for | -84.75 | | |
| Io ^{Note3} | | Bands FDD_E, FDD_F Note 5 | dBm/9 MHz | Channel 2 +19.68dB) | -84.25 | | |
| | | Bands FDD_G | | | -83.25 | | |
| | | Bands FDD_H | | | -82.75 | | |
| CRS \hat{E}_s / | ${\sf CRS}\hat{E}_s/N_{oc}$ | | dB | 13 | -6 | | |
| CSI-RS | CSI-RS \hat{E}_s/N_{oc} | | dB | 13 | 0 | | |
| Propagation | on cond | ition | - | - AWGN | | | |
| Note 1: | | G shall be used such | | | | | |
| | const | ant total transmitted | power spectral of | density is acl | nieved for | | |
| | | FDM symbols. | | | | | |
| Note 2: | | erence from other ce | | | | | |
| | the te | est is assumed to be | constant over su | ubcarriers an | d time and | | |
| | , | | ON (| | N_{cc} . | | |
| | shall fulfille | be modelled as AW0 | N of appropriat | e power for | oc to be | | |
| Note 3: | RSR | P and lo levels have | been derived fro | om other para | ameters for | | |
| | inforr | nation purposes. The | ey are not settab | le paramete | rs | | |
| | them | selves. lo levels are | calculated in CR | RS symbols o | of | | |
| | | surement subframe. | | - | | | |
| Note 4: | | P minimum requirem | | | | | |
| | | endent interference | and noise at each | ch receiver a | ntenna | | |
| 1 | port. | | | | | | |
| Note 5: | | | | | | | |
| | frequency of assigned E-UTRA channel bandwidth within 865- | | | | | | |
| Note 6: | 894 MHz. E-UTRA operating band groups are as defined in Section 3.5. | | | | | | |
| Note 7: | Except Band 29 and Band 32. | | | | | | |
| Note 8: | | C is provided to the UE | | onfig (in TS36 | .331) before | | |
| | | eginning of the test | | 3 (: 300) | , | | |

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 | ameter | Unit | Cell 1 | t 1 Cell 2 |
|--|-------------------------------------|------------|--|----------------------|
| E-UTRA RF Ch | annel Number | | Cell 1 | 2 |
| BW _{channel} | | MHz | 10 | 10 |
| Special subfran | ne | | 6 | • |
| configuration ^{Not} | e1 | | | |
| | configuration Note1 | | 0 | |
| Gap Pattern Id gapOffset | | ms | 9 | - |
| DMTC period | | ms | 160 | 160 |
| DMTC period o | | ms | 0 | 10 |
| | al occasion duration | ms | 2 | 2 |
| CSI-RS resource | | ma | 2 10 | 4 |
| CSI-RS periodic | | ms ms | 0 | |
| CSI-RS individu | | dB | 0 1 | 0 |
| CSI-RS muting | | | Enable | Enable |
| Time offset bety | ween cells | μs | - | 3 |
| Measurement b | | n_{PRB} | 22— | -27 |
| PDSCH Refere channel defined | nce measurement d in A.3.1.1.2 | | R.0 TDD | - |
| PDSCH allocati | | n_{PRB} | 13—36 | - |
| defined in A.3.1 | surement channel .2.2 | | R.6 T | DD. |
| OCNG Patterns A.3.2.2.1 (OP.1 A.3.2.2.2 (OP.2 | TDD) and | | 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_RB OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA OCNG_RA | | dB | 0 | 0 |
| p-C-r10[2] | | dB | 0 | 6 |
| $N_{oc}^{ m Note3}$ | Bands TDD_A Bands TDD_C Bands TDD_E | dBm/15 kHz | $(N_{oc} \text{ for } Channel 2 +6dB)$ | -115 -114 -113 |
| $CRS \hat{E}_{s}/I_{ot}$ | Danido IDD_L | dB | 13 | -6 |
| CSI-RS \hat{E}_s/I_{ot} | | dB | 13 | 0 |
| s / ot | Bands TDD_A | | | -121 |
| RSRP ^{Note4} | Bands TDD C | dBm/15 kHz | (RSRP for Cell 2 | -120 |
| | Bands TDD_E | | +25dB) | -119 |
| Bands TDD_A | | dBm/15 kHz | | 110 |
| CSI-RSRP | CSI-RSRP | | (RSRP for | (RSRP |
| Note3 Bands IDD_C | | | Cell 1 +0dB) | for Cell 2 +6dB) |
| | Bands TDD_E | | / | <u> </u> |
| Note 4 | Bands TDD_A | | (lo for | -86.25 |
| Io ^{Note4} | Bands TDD_C | dBm/9 MHz | Channel 2 | -85.25 |
| | Bands TDD_E | | +19.68dB) | -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: | 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and | | | | |
| Note 4: | shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. 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 | | | | |
| Note 5: | measurement subframe. RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | |
| Note 6: Note 7: | E-UTRA operating band of DMTC is provided to the before the beginning of te | JE in the measDS | ned in Section -Config (in T | n 3.5. S36.331) | |

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

| Pai | rameter | Unit | 0.11.4 | Test 1 | 0.110 |
|--|---|------------|--|--|---------------------------|
| E LITEA DE OL | 1.51 | | Cell 1 | Cell 2 | Cell3 |
| E-UTRA RF Ch | nannel 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 |
| | al occasion duration | ms | N/A | N/A | 1 |
| 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 | | n_{PRB} | | 22—27 | |
| PDSCH Refere channel defined | nce measurement d in A.3.1.1.1 | | R.0 FDD | R.0 FDD | - |
| PDSCH allocat | | n_{PRB} | 13—36 | 13—36 | - |
| defined in A.3.1 | surement channel | | | R.6 FDD | I |
| 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_RANote | e1 | dB | 0 | 0 | 0 |
| $N_{oc}^{$ | 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 | -117 -116.5 -116 -115.5 -115 -114 -113.5 | \cdot (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 Chanr | nel 1 +5.33dB) |

| | Bands FDD_G | | -84.76 | | |
|--|---|---|----------------------------------|----------------------------------|---------------|
| | Bands FDD_H | | -84.26 | | |
| \hat{E}_s/N_{oc} | | dB | -4 | 3 | -1 |
| Propagat | ion condition | - | | AWGN | |
| Note 1: Note 2: | OCNG shall be used such transmitted power spectra Interference from other ce to be constant over subca | al density is achievells and noise sour | ed for all OFI rces not speci | DM symbols. ified in the test | t is assumed |
| | appropriate power for N_{o} | $_{c}$ to be fulfilled. | | | |
| Note 3: | RSRP and lo 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 band aggregation supported by | • . | nds on the co | nfiguration of t | he carrier |
| Note 6: | , , , , | | | | the assigned |
| 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. | | | | | el bandwidth |
| Note 8: | E-UTRA operating band g | | | | |

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

| Parameter | Unit | Test 1 | | | |
|---|------------|--------------------------------|---|------------------------------|--|
| | Unit | 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 occasion duration | ms | N/A | N/A | 2 | |
| 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 | ı | - | ≤ 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 measurement channel 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_RB OCNG_RA OCNG_RB Note2 Bands TDD_A | dB | -117 | 0 | 0 | |
| N _{oc} Note3 Bands TDD_C Bands TDD_E | dBm/15 kHz | -116 -115 | (N_{oc} for +10 | Channel 1 dB) | |
| $\hat{\mathbf{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | -4 | 0.5 | -5.76 | |
| RSRP ^{Note4} Bands TDD_A Bands TDD_C Bands TDD_E Bands TDD_A | dBm/15 kHz | -121 -120 -119 -87.76 | (RSRP for Cell 1 +8dB) | (RSRP for Cell 1 +4dB) | |
| Io ^{Note4} Bands TDD_C Bands TDD_E | dBm/9 MHz | -86.76 -85.76 | (lo for C +5.3 | hannel 1 3dB) | |
| 1 4 / | | | | | |
| \hat{E}_s/N_{oc} | dB | -4 | 3 | -1 | |

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. |
|---------|---|
| 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.9.1.34.3 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

| | | | 1 | T 44 | |
|--|---|--------------------------------|--|--|---------------------------|
| Para | ameter | Unit | Cell 1 | Test 1 Cell 2 | Cell3 |
| E-UTRA RF Cha | annel Number | | 1 | 2 | 2 |
| BW _{channel} | annei Number | MHz | 10 | 10 | 10 |
| | coll1 | | - | 0 | 3 |
| Timing offset to cell1 Time alignment error between cell 2 and cell 1 | | <u>μ</u> s | - | ≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1. | - |
| DMTC period | | ms | 160 | | 60 |
| DMTC period of | fset | ms | 0 | 1 | 10 |
| Discovery signa | l occasion duration | ms | 1 | | 1 |
| CSI-RS resourc | e configuration | | 2 | 4 | 6 |
| CSI-RS periodic | city | ms | 10 | 10 | 10 |
| CSI-RS subfram | ne offset | ms | 0 | 0 | 0 |
| CSI-RS individu | al offset[2] | dB | 0 | 0 | 0 |
| CSI-RS muting | | | Enable | Enable | Enable |
| Measurement b | andwidth | n_{PRB} | | 22—27 | |
| PDSCH Referer channel defined | nce measurement in A.3.1.1.1 | | R.0 FDD | R.0 FDD | - |
| PDSCH allocation | PDSCH allocation | | 13—36 | 13—36 | - |
| defined in A.3.1 | surement channel .2.1 | $n_{{\scriptscriptstyle PRB}}$ | | 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_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RANote | | dB | 0 | 0 | 0 |
| p-C-r10[2] | | dB | 6 | 6 | 6 |
| $N_{oc}^{$ | 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 | -117 -116.5 -116 -115.5 -115 -114 -113.5 | (N_{oc} for Ch | annel 1 +1dB) |
| ${\sf CRS}\hat{{ m E}}_{_{ m s}}/{ m I}_{_{ m ot}}$ | | dB | -4 | 0.46 | -5.76 |
| CSI-RS $\hat{E}_{_{s}}/I_{_{ot}}$ | | dB | 2 | 6.46 | 0.24 |
| RSRP ^{Note3} | Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D FNote 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 | | (00) 0000 | | | | |
| | | Bands FDD_B | | -114.5 | | | | | | |
| | | Bands FDD_C | | -114 | (CSI- | | | | | |
| CSI- | Bands FDD_D | dBm/15 kHz | -113.5 | RSRP for | (CSI-RSRP for Cell 1 | | | | | |
| RSRP ^{Note} | RSRP ^{Note3} | Bands FDD_E, | UDIII/13 KHZ | -113 | Cell 1 | +4dB) | | | | |
| | | FDD_F Note 6 | | | +8dB) | 1 100) | | | | |
| | | 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 | (lo for Chann | nel 1 +5.33dB) | | | | |
| | | Bands FDD_E, FDD_F Note 6 | abiliyo ivii iz | -85.76 | (10 for Griain | 101 1 10.0002) | | | | |
| | | Bands FDD_G | | -84.76 | | | | | | |
| | | Bands FDD_H | | -84.26 | | | | | | |
| CRS \hat{E}_{s} , | $/N_{oc}$ | | dB | -4 | 3 | -1 | | | | |
| CSI-RS | \hat{E}_s/N | ос | dB | 2 | 9 | 5 | | | | |
| Propagat | tion co | ndition | - | | AWGN | | | | | |
| Note 1: | | IG shall be used such | n that both cells ar | e fully allocat | ed and a cons | tant total | | | | |
| | | smitted power spectra | | | | | | | | |
| Note 2: | | ference from other ce | | | | | | | | |
| | to be | constant over subca | arriers and time an | id shall be mo | odelled as AW | GN of | | | | |
| | appr | opriate power for $N_{_{\scriptscriptstyle O}}$ | to be fulfilled. | | | | | | | |
| Note 3: | RSR | P and lo levels have | been derived from | n other param | eters for inform | mation | | | | |
| | | oses. They are not se | | | | | | | | |
| | | symbols of measure | | | | | | | | |
| Note 4: | | | | | | rference and | | | | |
| | noise at each receiver antenna port. | | | | | | | | | |
| Note 5: | The | selection of the band | s for testing deper | nds on the co | nfiguration of t | he carrier | | | | |
| | aggregation supported by the UEs. | | | | | | | | | |
| Note 6: | | | | | For Band 26, the tests shall be performed with the carrier frequency of the assigned | | | | | |
| 11010 0. | | | | | r frequency of | the assigned | | | | |
| Note 7: | E-U1 | Band 26, the tests sh FRA channel bandwic test verifies the RRM | dth within 865-894 | MHz. | | • | | | | |

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:

- 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.

and is performed according to the principle defined in section A.3.6.1.

DMTC configurations are provided to the UE in the measDS-Config (in TS36.331) before the

E-UTRA operating band groups are as defined in Section 3.5.

- 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

| В | aramatar. | l lmit | | Test 1 | |
|--|--|------------|----------------------------|---|--------------------------------------|
| | arameter | Unit | Cell 1 | Cell 2 | Cell 3 |
| E-UTRA RF Chann | el Number | | 1 | <u> </u> | |
| BW _{channel} | Note1 | MHz | | 10 | |
| Special subframe c | ontiguration Note1 | | 6 | | |
| Uplink/downlink cor | | | | 0 | |
| Timing offset to Cel | II I | μs | - | - | 3 |
| , and the second | or between cell 2 and cell 1 | | - | ≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1 | - |
| DMTC period | | ms | 160 | | 60 |
| DMTC period offset Discovery signal of | | ms | 2 | | 0 |
| CSI-RS resource co | | ms | 2 | 4 | 6 |
| CSI-RS periodicity | omgaration | ms | 10 | 10 | 10 |
| CSI-RS subframe of | offset | ms | 0 | 0 | 0 |
| CSI-RS individual of | | dB | 0 | 0 | 0 |
| CSI-RS muting | | | Enable | Enable | Enable |
| Measurement band | | n_{PRB} | | 22—27 | |
| PDSCH Reference defined in A.3.1.1.2 | measurement channel | | R.0 TDD | R.0 TDD | - |
| PDSCH allocation | | | 13—36 | 13—36 | - |
| PDCCH/PCFICH/P 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_RA PDCCH_RA PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA ^{Note2} OCNG_RB ^{Note2} | | dB | 0 | 0 | 0 |
| p-C-r10[2] | T | dB | 6 | 6 | 6 |
| $N_{oc}^{ m Note3}$ | Bands TDD_A Bands TDD_C Bands TDD_E | dBm/15 kHz | -117 -116 -115 | (N_{oc} for +10 | Channel 1 dB) |
| ${\sf CRS}\hat{\rm E}_{_{ m s}}/{ m I}_{_{ m ot}}$ | <u> </u> | dB | -4 | 0.46 | -5.76 |
| CSI-RS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$ | | dB | 2 | 6.46 | 0.24 |
| 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) |
| CSI-RSRP ^{Note4} | Bands TDD_A Bands TDD_C Bands TDD_E | dBm/15 kHz | -115 -114 -113 | (CSI- RSRP for Cell 1 +8dB) | (CSI- 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 C | • |

| $CRS\hat{E}_s$ / | N_{oc} | dB | -4 | 3 | -1 |
|--|--|--|------------------|----------------|---------------|
| CSI-RS É | \hat{E}_s/N_{oc} | dB | 2 | 9 | 5 |
| Propagation 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 noise sources not specified in the test is assumed to constant over subcarriers and time and shall be modelled as AWGN of appropriate po | | | | | |
| | for N_{oc} to be fulfilled. | | | | |
| Note 4: | RSRP and Io 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: | The selection of the bands for testing aggregation supported by the UEs. | depends on the | configuration | of the carrie | r |
| Note 7: | | ent which is independent of channel bandwidth 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 | $5 \text{MHz:} \\ N_{\text{RB,c}} = 25 \\ 10 \text{MHz:} \\ N_{\text{RB,c}} = 50 \\ 20 \text{MHz:} \\ N_{\text{RB,c}} = 100$ | 5MHz: N _F 10MHz: N 20MHz: N _F | $_{RB,c} = 50$ | 5MHz: $N_{RB,c} = 25$ 10MHz: $N_{RB,c} = 50$ 20MHz: $N_{RB,c} = 100$ | |
| Special subfi | ame | | - | 6 | | | 6 |
| configuration Uplink/downl configuration | ink | | - | 1 | | | 1 |
| Measuremer | | n_{PRB} | 5MHz: 10-15 10MHz: 22-27 20MHz: 47-52 | 5MHz: 10MHz: 20MHz: | 22-27 | 5MHz: 10-15 10MHz: 22-27 20MHz: 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_E | | -121 | | | roub) | · 10D) |
| RSRP ^{Note4} | Bands FDD_B | dBm/15 | -120.5 | | | | |
| 1.5 | Bands FDD_B | kHz | -120.5 | | | | |
| | Bands FDD_C | | | | | | |
| | | | -119.5 | | | | |
| | Bands | | 440 | - | _ | - | - |
| | 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 | (lo for Chani | nel 1 +5.33dB |
| | Bands TDD_C | | - | · +10l | log | +10 | Olog |
| | Bands TDD E | | | (N _{RB channel2} / I | N _{RB channel 1})) | | / N _{RB channel 1})) |
| | Bands FDD A | 1 | -87.76+10log(N _{RB.7} /50) | • | ,, | , | ,, |
| | Bands FDD B | | -87.26+10log(N _{RB,o} /50) | | | | |
| lo ^{Note4} | Bands FDD C | dBm/ | -86.76+10log(N _{RB,} /50) | | | | |
| 10 | Bands FDD D | BW _{channel} | -86.26+10log(N _{RB,} /50) | | | | |
| | Bands | Gridinio | | - | | | _ |
| | FDD E. | | -85.76 +10log(N _{RB.} /50) | | | | |
| | FDD_F Note 7 | | (- IKB,0) | | | | |
| | 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 offse | t to cell 1 | μs | - | 0 | 3 | 0 | 3 |
| Time alignm | ent error relative | | | < Τ ΛΓ | | ∠ Т ∧ ⊏ | |
| to cell 1 Note 8 | | | - | ≤TAE | - | ≤ TAE | - |
| Time alignm | ent error relative | | | | | ≤TAE | |
| to cell 2 ^{Note 8} | | | - | - | - | ≥ IAE | - |
| | | ne and uplink-o | downlink configurations see | Tables 4.2-1 and 4 | 4.2-2 in TS 36.2° | 11. | |
| Note 2: | OCNG shall be use | ed such that all | cells are fully allocated and | a constant total tr | ansmitted power | spectral dens | ity is |
| | achieved for all OF | DM symbols. | - | | | | |
| Note 3: | nterference from o | ther cells and | noise sources not specified i | n the test is assur | ned to be consta | int over subca | rriers and |
| | بمرا المحام لمسم مست | | ICNL of annuanciate navious fo | M h £1£:11 | 1 | | |

- 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.
- For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within Note 7: 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 configuration Note1 | | 6 | - | | | - |
| Uplink/downlink configuration ^{Note1} | | 1 | | - | | - |
| Measurement bandwidth | n_{PRB} | 5MHz: 10-15 10MHz: 22-27 20MHz: 47-52 | 10MHz 20MHz | : 10-15 :: 22-27 :: 47-52 | 10MF 20MF | z: 10-15 lz: 22-27 lz: 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 | $n_{{\it PRB}}$ | 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 | | | | | | |
| OCNG_RA ^{Note1} | | | | | | |
| OCNG_RB ^{Note1} | | | | | | |
| Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F 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 | | -117 | | | | |
| Bands TDD_C Bands TDD_E | | -116 -115 | | _ | | - |
| \hat{E}_s/N_{oc} | dB | -4 | 3 | -1 | 3 | -1 |

| \hat{E}_{s}/I_{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 | | -121 | | | | |
| | Bands TDD_C | | -120 | = | - | - | = |
| | Bands TDD_E | | -119 | | | | |
| Io ^{Note4} | Bands FDD_A Bands FDD_B Bands FDD_D Bands FDD_E, FDD_F Note 7 Bands FDD_G Bands FDD_H Bands TDD_A Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_C | dBm/ BW _{channel} | -87.76+10log(N _{RB.0} /50) -86.76+10log(N _{RB.0} /50) -85.76+10log(N _{RB.0} /50) | (lo for Channel 1 +5.33dB +10log (N _{RB channel2} / N _{RB channel 1})) | | ` + <i>′</i> | nnel 1 +5.33dB 10log / N _{RB channel 1})) |
| Propagation | | - | 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 | - |
| | 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 | | | | | | | |

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.

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

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 | | | 1 | | 2 | |
| Number | | | - | | | |
| DIA | | | 5MHz: $N_{RB,c} = 25$ | 5MHz: N _{RB,c} = 25 | | |
| BW _{channel} | | MHz | $10MHz: N_{RB,c} = 50$ | | $N_{RB,c} = 50$ | |
| | | | $20MHz: N_{RB,c} = 100$ 5MHz: 10-15 | | I _{RB,c} = 100 | |
| Measureme | ent bandwidth | n_{PRB} | 10MHz: 22-27 | | :: 22 - 27 | |
| Modedionic | nic barrawiani | PRB | 20MHz: 47-52 | | :: 47-52 | |
| PDSCH Re | ference | | 5MHz: R.5 FDD | 5MHz: R.5 FDD | | |
| measureme | ent channel | | 10MHz: R.0 FDD | 10MHz: R.0 FDD | - | |
| defined in A | 3.1.1.1 | | 20MHz: R.4 FDD | 20MHz: R.4 FDD | | |
| DD00H-II- | 4: | | 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 | |
| Reference measurement | | | 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 | |
| PBCH_RA | | | | FDD | FDD | |
| PBCH_RA | | - | | | | |
| PSS_RA | | 1 | | | | |
| SSS_RA | | | | | | |
| PCFICH_RI | | | | | | |
| PHICH_RA | | 1 | | | | |
| PHICH_RB | | dB | 0 | 0 | 0 | |
| PDCCH_RA | | | | | | |
| | PDCCH_RB | | | | | |
| PDSCH_RA | | | | | | |
| PDSCH_RE | 3 Note1 | 1 | | | | |
| OCNG_RA | Note1 | 1 | | | | |
| OCNG_RB | Bands FDD_A | | -117 | | | |
| | Bands FDD_A | 1 | -116.5 | | | |
| | Bands FDD_C | • | -116 | | | |
| λ/ Note2 | Bands FDD_D | dBm/ | -115.5 | (N) for Obs | | |
| $N_{oc}^{ m Note2}$ | Bands FDD F | 15kHz | 115 | (IV _{oc} for Cha | annel 1 +1dB) | |
| | FDD_F Note 6 | | -115 | | | |
| | Bands FDD_G | | -114 | | | |
| | Bands FDD_H | | -113.5 | | | |
| \hat{E}_s/N_{oc} | | dB | -4 | 3 | -1 | |
| \hat{E}_{s}/I_{ot} | | dB | -4 | 0.46 | -5.76 | |
| | Bands FDD_A | | -121 | | | |
| | Bands FDD_B | 1 | -120.5 | | | |
| | Bands FDD_C | | -120 | | | |
| RSRP ^{Note3} | Bands FDD_D | dBm/ | -119.5 | (RSRP for Cell 1 | (RSRP for Cell 1 | |
| | Bands FDD_E, FDD_F Note 6 | 15kHz | -119 | +8dB) | +4dB) | |
| | | | | | | |
| | Bands FDD_G Bands FDD_H | | -118 -117.5 | | | |
| | | | -87.76 | | <u>l</u> | |
| | Bands FDD_A | | +10log(N _{RB,c} /50) | | | |
| | Banda EDD B | 1 | -87.26 | | | |
| No. 1-0 | Bands FDD_B | dBm/ | +10log(N _{RB,c} /50) | (In for Channel 1 | +5.33dB +10log | |
| Io ^{Note3} | Bands FDD_C | BW _{channel} | -86.76 | ` | N _{RB channel 1})) | |
| | | - · · channel | +10log(N _{RB,c} /50) | (TID CHANNELZ / | ND GIAIIIEI I// | |
| | Bands FDD_D | | -86.26 +10log(N _{RB,o} /50) | | | |
| | Bands FDD_E, | | -85.76 | | | |
| L | | 1 | | 1 | | |

| FDD_F | Note 6 | | +10log(N _{RB,c} /50) | | |
|-----------------------|------------|---------|---|-------|-----------|
| Bands | FDD_G | | -84.76 +10log(N _{RB,o} /50) | | |
| Bands | FDD_H | | -84.26 +10log(N _{RB,c} /50) | | |
| Propagation Conditi | on | | AWGN | AWGN | AWGN |
| Antenna Configurati | ion | | 1x2 | 1x2 | 1x2 |
| Timing offset to Cell | 1 | μs | - | 0 | 3 |
| Time alignment erro | r relative | | - | ≤ TAE | |
| N 4 4 00NO 1 | | 1 41 41 | 4 11 (11 11 | | 1.4 144 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.
- 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 | 3 | | |
| | | | | I _{RB,c} = 25 | | |
| BW _{channel} | | MHz | | $N_{RB,c} = 50$ | | |
| | | | 20MHz: N _{RB,c} = 100 | | | |
| Magaurama | ent 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 | - | | |
| | DD COLUDE TO LUCK | | 20MHz: 38-61 | | | |
| | FICH/PHICH | | 5MHz: R.11 FDD | 5MHz: R.11 FDD | | |
| | Reference measurement channel defined in A.3.1.2.1 | | 10MHz: R.6 FDD | 10MHz: R.6 FDD | | |
| Charmer defined in A.S. 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.1 FDD | 10MHz: OP.2 FDD | | |
| A.3.2.1 | | | 20MHz: OP.11 | 20MHz: OP.12 | | |
| | | | FDD | FDD | | |
| PBCH_RA | | | | | | |
| PBCH_RB | | | | | | |
| PSS_RA | | | | | | |
| | SSS_RA | | | | | |
| | PCFICH_RB | | | | | |
| | PHICH_RA | | | 0 | | |
| | PHICH_RB | | 0 | | | |
| | PDCCH_RA | | | | | |
| PDCCH_RE | | | | | | |
| PDSCH_RE | | | | | | |
| OCNG_RA | Note1 | | | | | |
| OCNG_RB | Note1 | | | | | |
| | Bands FDD_A | | | <u>I</u> | | |
| | Bands FDD_B | | | | | |
| | Bands FDD_C | | (N_{oc} for Channel 1 +1dB) | | | |
| $N_{oc}^{ m Note2}$ | Bands FDD_D | dBm/ | | | | |
| 1 voc | Bands FDD_E, | 15kHz | | | | |
| | FDD_F Note 6 | | | | | |
| | Bands FDD_G | | | | | |
| <u> </u> | Bands FDD_H | | | | | |
| \hat{E}_s/N_{oc} | | dB | 3 | -1 | | |
| \hat{E}_s/I_{ot} | | dB | 0.46 | -5.76 | | |
| | Bands FDD_A | | | | | |
| | Bands FDD_B | | | | | |
| | Bands FDD_C | | | | | |
| RSRP ^{Note3} | Bands FDD_D | dBm/ | (RSRP for Cell 1 | (RSRP for Cell 1 | | |
| I KOKI | Bands FDD_E, FDD_F Note 6 | 15kHz | +8dB) | +4dB) | | |
| | | | | | | |
| | Bands FDD_G | | | | | |
| | Bands FDD_H | | | | | |
| | Bands FDD_A | | | | | |
| | Bands FDD_B Bands FDD_C | | | | | |
| . Note? | Bands FDD_C | dBm/ | (In for Channel 1 | +5.33dB +10log | | |
| Io ^{Note3} | Bands FDD E. | BW _{channel} | (N _{RB channel3} / | | | |
| | FDD_F Note 6 | - 01/4111161 | (ND Glaillield / | . AD GRAINION 1// | | |
| | Bands FDD_G | | | | | |
| | Bands FDD_H | | | | | |

| Propagati | on Condition | | AWGN | AWGN |
|-----------------------------------|---|----------------|---|------------------------|
| Antenna (| Configuration | | 1x2 | 1x2 |
| Timing off | fset to Cell 1 | μs | 0 | 3 |
| Time aligito cell 1 No | Time alignment error relative to cell 1 Note 7 | | ≤TAE | - |
| Time aligito cell 2 ^{No} | Time alignment error relative to cell 2 ^{Note 7} | | ≤TAE | - |
| Note 1: | OCNG shall be use | | both cells are fully alloc | |
| Note 2: | Interference from of | her cells an | density is achieved for d noise sources not speak abcarriers and time and | ecified in the test is |
| | as AWGN of approp | oriate power | for N_{oc} to be fulfilled. | |
| Note 3: | | | derived from other para not settable parameter | |
| Note 4: | | | re specified assuming receiver antenna port. | independent |
| Note 5: | | bands for te | esting depends on the | configuration of the |
| Note 6: | For Band 26, the te | sts shall be p | performed with the card dwidth within 865-894 N | |
| Note 7: | Time alignment erro | or (TAE) as s | specified in TS 36.104 he type of carrier aggre | [30] clause 6.5.3.1. |
| Note 8: | | | are as defined in Sect | |

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 RI | E-UTRA RF Channel | | 1 | , | 2 | | |
| Number | | | | | | | |
| | | | 5MHz: $N_{RB,c} = 25$ | | $I_{RB,c} = 25$ | | |
| BW _{channel} | | | $10MHz: N_{RB,c} = 50$ | | $N_{RB,c} = 50$ | | |
| | | | $20MHz: N_{RB,c} = 100$ | 20MHz: N | I _{RB,c} = 100 | | |
| Special sub | oframe | | | 6 | | | |
| configuration | on " | | | | | | |
| Uplink/dow configuration | niink on ^{Note1} | | | 1 | | | |
| oormgaratic | 711 | | 5MHz: 10-15 | 5MHz | 10-15 | | |
| Measureme | ent bandwidth | n_{PRB} | 10MHz: 22-27 | | : 22-27 | | |
| Mododiom | one banaman | PRB | 20MHz: 47-52 | | : 47-52 | | |
| PDSCH Re | ference | | 5MHz: R.4 TDD | 5MHz: R.4 TDD | 02 | | |
| measureme | | | 10MHz: R.0 TDD | 10MHz: R.0 TDD | _ | | |
| defined in A | | | 20MHz: R.3 TDD | 20MHz: R.3 TDD | _ | | |
| defined in F | 1.0.1.1.2 | | 5MHz: 7-17 | 5MHz: 7-17 | | | |
| PDSCH allocation | | n | 10MHz: 13-36 | 10MHz: 13-36 | | | |
| I DOCH all | Joanon | n_{PRB} | | | _ | | |
| PDCCH/PCFICH/PHICH | | | 20MHz: 38-61 | 20MHz: 38-61 5MHz: R.11 TDD | 5MU D 11 TDD | | |
| | | | 5MHz: R.11 TDD | _ | 5MHz: R.11 TDD | | |
| | measurement fined in A.3.1.2.2 | | 10MHz: R.6 TDD | 10MHz: R.6 TDD | 10MHz: R.6 TDD | | |
| channel de | iiiieu iii A.3.1.2.2 | | 20MHz: R.10 TDD | 20MHz: R.10 TDD | 20MHz: R.10 TDD | | |
| OCNG Patt | terns defined in | | 5MHz: OP.9 TDD | 5MHz: OP.9 TDD | 5MHz: OP.10 TDD | | |
| A.3.2.2 | | | 10MHz: OP.1 TDD | 10MHz: OP.1 TDD | 10MHz: OP.2 TDD | | |
| | | | 20MHz: OP.7 TDD | 20MHz: OP.7 TDD | 20MHz: OP.8 TDD | | |
| PBCH_RA | | | | | | | |
| PBCH_RB | | | | | | | |
| PSS_RA | | | | | | | |
| SSS_RA | | | | | | | |
| PCFICH_R | В | | | | | | |
| PHICH_RA | 1 | | | | | | |
| PHICH_RB | | dB | 0 | 0 | 0 | | |
| | PDCCH_RA | | - | | - | | |
| | PDCCH_RB | | | | | | |
| | PDSCH_RA | | | | | | |
| | PDSCH_RB | | | | | | |
| OCNG_RA | Note2 | | | | | | |
| OCNG_RB | Note2 | | | | | | |
| | Bands TDD_A | | -117 | | <u>l</u> | | |
| $N_{oc}^{ m \ Note3}$ | Bands TDD_A Bands TDD_C | dBm/ | -116 | (N) for Ch | annal 1 + 1 dD\ | | |
| IV oc | | 15kHz | | (1V _{oc} for Ch | annel 1 +1dB) | | |
| ^ / | Bands TDD_E | | -115 | | | | |
| \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 | | -121 | | | | |
| RSRP ^{Note4} | Bands TDD_C | dBm/ | -120 | (RSRP for Cell 1 | (RSRP for Cell 1 | | |
| | Bands TDD_E | 15kHz | -119 | +8dB) | +4dB) | | |
| | _ | | -87.76 + | | <u> </u> | | |
| | Bands TDD_A | | 10log(N _{RB,c} /50) | | | | |
| Note 4 | | dBm/ | -86.76 + | (In for Channel 1 | +5.33dB +10log | | |
| Io ^{Note4} | Bands TDD_C | BW _{channel} | 10log(N _{RB,c} /50) | | | | |
| | | _ Dvv channel | -85.76 + | (N _{RB channel2} / N _{RB channel 1})) | | | |
| | Bands TDD_E | | | | | | |
| Dropogatic | n Condition | | 10log(N _{RB,c} /50) | AWGN | ANA/CNI | | |
| Propagation | | | AWGN | | AWGN | | |
| | onfiguration | | 1x2 | 1x2 | 1x2 | | |
| Timing offse | | μs | - | 0 | 3 | | |
| Time alignn | nent error | | _ | ≤TAE | _ | | |
| relative to o | cell 1 Note / | | = | | _ | | |
| Noto 1: | For appoint aubfror | مناميا لممام | k downlink configuratio | ns see Tables 4 2-1 an | d 4 2 2 in TC 26 244 | | |

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: | 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)

| Pa | rameter | Unit | Cell 4 | Cell 5 |
|---|---|-------------------------------|--|--|
| E-UTRA RF Channel | | - Cint | | • |
| Number | | | • | 3 |
| | | | | I _{RB,c} = 25 |
| BW _{channel} | | MHz | | $N_{RB,c} = 50$ |
| 0 | , | | 20MHz: N | I _{RB,c} = 100 |
| Special sub configuration | frame _Note1 | | (| 3 |
| Uplink/dowr | llink | | | |
| configuratio | n ^{Note1} | | • | 1 |
| coringulatio | 11 | | 5MHz: | 10-15 |
| Measurement bandwidth | | n_{PRB} | | :: 22-27 |
| | | PKB | 20MHz | :: 47-52 |
| PDSCH Re | ference | | 5MHz: R.4 TDD | |
| measureme | | | 10MHz: R.0 TDD | N/A |
| defined in A.3.1.1.2 | | | 20MHz: R.3 TDD | |
| DDCCH -III | | | 5MHz: 7-17 | N1/A |
| PDSCH allo | ocation | n_{PRB} | 10MHz: 13-36 | N/A |
| PDCCH/PCFICH/PHICH | | | 20MHz: 38-61 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 |
| | | | 5MHz: OP.9 TDD | 5MHz: OP.10 TDD |
| | erns defined in | | 10MHz: OP.1 TDD | 10MHz: OP.2 TDD |
| A.3.2.2 | | | 20MHz: OP.7 TDD | 20MHz: OP.8 TDD |
| PBCH_RA | | | | |
| PBCH_RB | | | | |
| PSS_RA | | | | |
| SSS_RA | | | | |
| PCFICH_R | | | | |
| PHICH_RA | | | | |
| PHICH_RB | | dB | 0 | 0 |
| PDCCH_R/ | | | | |
| PDCCH_RE | | | | |
| PDSCH_RA | | | | |
| PDSCH_RE OCNG_RA | | - | | |
| OCNG_RB | | - | | |
| OCNG_RB | Bands TDD A | | | |
| $N_{oc}^{ m Note3}$ | Bands TDD_A Bands TDD_C | dBm/ | (N_{ac}) for Channel 1 +1dB) | |
| 1 voc | Bands TDD_6 | 15kHz | (11000) | anner i riab) |
| \hat{E}_s/N_{oc} | , | dB | 3 | -1 |
| ∠ _s / 1 v oc | | | | |
| \hat{E}_s/I_{ot} | | dB | 0.46 | -5.76 |
| | Bands TDD_A | dDr. / | (DODD (C - !! 1 | (DODD (-: 0 # 1 |
| RSRP ^{Note4} | Bands TDD_C | dBm/ | (RSRP for Cell 1 +8dB) | (RSRP for Cell 1 +4dB) |
| - | Bands TDD_E | 15kHz | +oub) | T4uD) |
| <u> </u> | Bands TDD A | | | +5 33dB +10log |
| | Bands TDD_A | dBm/ | (lo for Channel 1 +5.33dB +10log | |
| Io ^{Note4} | Bands TDD_C | dBm/ | | |
| Io ^{Note4} | Bands TDD_C Bands TDD_E | dBm/ BW _{channel} | (N _{RB channel3} / | N _{RB channel 1})) |
| Io ^{Note4} | Bands TDD_C Bands TDD_E Condition | | (N _{RB channel3} / | N _{RB channel 1})) AWGN |
| Io ^{Note4} Propagation Antenna Co | Bands TDD_C Bands TDD_E Condition onfiguration | | (N _{RB channel3} / AWGN 1x2 | N _{RB channel 1})) AWGN 1x2 |
| Io ^{Note4} Propagation Antenna Co Timing offse | Bands TDD_C Bands TDD_E Condition onfiguration et to Cell 1 | | (N _{RB channel3} / | N _{RB channel 1})) AWGN |
| Io ^{Note4} Propagation Antenna Co Timing offse Time alignm | Bands TDD_C Bands TDD_E Condition Onfiguration et to Cell 1 | BW _{channel} | (N _{RB channel3} / AWGN 1x2 0 | N _{RB channel 1})) AWGN 1x2 |
| Propagation Antenna Co Timing offse Time alignm relative to c | Bands TDD_C Bands TDD_E Condition Infiguration Et to Cell 1 Inent error Inell 1 Note 7 | BW _{channel} | (N _{RB channel3} / AWGN 1x2 | N _{RB channel 1})) AWGN 1x2 |
| Io ^{Note4} Propagation Antenna Co Timing offse Time alignm | Bands TDD_C Bands TDD_E Condition Infiguration Et to Cell 1 Inent error Inent error Inent error Inent error | BW _{channel} | (N _{RB channel3} / AWGN 1x2 0 | N _{RB channel 1})) AWGN 1x2 |

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

| Parameter | | Unit | Test 1 | | Test 2 | | Test 3 | |
|--|----------------------------------|--------------------------------|--------------|-----------|------------|-------------|------------------|------------------------|
| | | | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| | hannel Number | | 1 | | 1 | | 1 | |
| BW _{channel} | | MHz | 10 | | 10 | | 10 | |
| Measurement bandwidth | | $n_{{\scriptscriptstyle PRB}}$ | 22—27 | | 22—27 | | 22—27 | |
| | PDSCH Reference 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 | | | | R.6 FDD | | R.6 FDD | |
| measurement channel defined in | | | R.6 | FDD | | | | |
| A.3.1.2.1 | | | OP.1 | OP.2 | OP.1 | OP.2 | OP.1 | OP.2 |
| OCNG Pattern | s defined in A.3.2.1 | | FDD | FDD | FDD | FDD | FDD | FDD |
| PBCH_RA | | - | | | 0 | | 0 | 0 |
| PBCH_RB | | | | | | 0 | | |
| PSS_RA | | | | | | | | |
| SSS_RA PCFICH_RB | | | | | | | | |
| PHICH_RA | | | | | | | | |
| PHICH_RB | | dB | 0 | 0 | | | | |
| PDCCH_RA | | | | | | | | |
| PDCCH_RB | | | | | | | | |
| | PDSCH_RA | | | | | | | |
| OCNG_RA ^{Note} | PDSCH_RB | | | | | | | |
| OCNG_RA | | - | | | | | | |
| OONO_ND | Bands FDD_A | | | | | | -116 | |
| | Bands FDD_C | | -106 | | -86 | | -115 | |
| $N_{oc}^{ m Note2}$ | Bands FDD_D | | | | | | -114.5 | |
| 1 voc | Bands FDD_E, FDD_F Note 4 | dBm/15 kHz | | | | | -114 | |
| | Bands FDD_G Note 6 | | | | | | -113 | |
| | Bands FDD_G Bands FDD_H | | | | | | -112.5 | |
| \hat{E}_s/N_{oc} | _ | dB | 6 | 1 | 6 | 1 | 3 | -1 |
| | | 4D | 2.5 | | 0.5 | | 0.40 | F 70 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | T | dB | 2.5 | -6 | 2.5 | -6 | 0.46 | -5.76 |
| | Bands FDD_A Bands FDD_B | | | | | | -113 -112.5 | -117 -116.5 |
| | Bands FDD_B | dBm/15 kHz | -100 | | -80 | -85 | -112.5 | -116.5 |
| DODDNote3 | Bands FDD_D | | | 405 | | | -111.5 | -115.5 |
| RSRP ^{Note3} | Bands FDD_E, | | | -105 | | | -111 | -115 |
| | FDD_F Note 4 | | | | | | | |
| | Bands FDD_G Note 6 | | | | | | -110 | -114 |
| | Bands FDD_H | | | | | | -109.5 -82 | -113.5 |
| lo ^{Note3} | Bands FDD_A Bands FDD_B | dBm/9 MHz | -70.27 | | -50.27 | | | . 43 .93 |
| | Bands FDD_C | | | | | | | .43 |
| | Bands FDD_D | | | | | | -80.93 | |
| | Bands FDD_E, | | | | | | -80.43 | |
| | FDD_F Note 4 Bands FDD_G Note 6 | | | | | | | |
| | Bands FDD_H | | | | | | -79.43 -78.93 | |
| Propagation condition | | - | AWGN | | AWGN | | AWGN | |
| Correlation Matrix and Antenna | | | 1x1 | | 1x1 | | 1x1 | |
| Configuration | 10 1 11 | | | | | | | |
| Note 1: OCNG shall be used such t | | hat both cells a | e fully allo | hated and | a constant | total trans | mitted now | ıer |

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

| Parameter | | Unit | Test 1 | | Test 2 | | Test 3 | |
|---|--|------------|-------------------|-------------|-------------------|-------------|--|--|
| | | | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| 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.3.1.1.4 | | TKB | R.1 HD- FDD | - | R.1 HD- FDD | - | R.1 HD- FDD | - |
| PDSCH allocation | | n_{PRB} | 13—36 | - | 13—36 | - | 13—36 | - |
| PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.3 | | | R.3 HD-FDD | | R.3 HD-FDD | | R.3 HD-FDD | |
| OCNG Patterns 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_RA PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RA POSCH_RA POSCH_RB OCNG_RA OCNG_RB Bands DD_A | | dB | 0 | 0 | 0 | 0 | 0 -1 | |
| N _{oc} Note2 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 |
| lo ^{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/9 MHz | |).27 | | .27 | -82.43 -81.93 -81.43 -80.93 -80.43 -79.43 -78.93 | |
| Propagation condition | | - | AWGN | | AWGN | | AWGN | |
| Correlation Matrix and Antenna | | | 1) | κ1 | 1x1 | | 1x1 | |
| Configuration Note 1: OCNG shall be used such t | | | | | | | | |

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.

| | vith 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 | | Unit | Test 1 | | Test 2 | | Test 3 | |
|---|--|--------------------------------|--------------|-------------|----------------|-------------|----------------------|----------------------|
| | | | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| | E-UTRA RF Channel Number | | 1 | | 1 | | 1 | |
| | BW _{channel} | | 10 | | 1 | 0 | 1 | 0 |
| Special subframe configuration Note1 | | | 6 | | 6 | | 6 | |
| Uplink/downlin | nk configuration Note1 | | 1 | | 1 | | 1 | |
| Measurement | | n_{PRB} | 22—27 | | 22—27 | | 22—27 | |
| PDSCH Reference measurement channel defined in A.3.1.1.5 | | | R.12 TDD | - | R.12 TDD | - | R.12 TDD | - |
| PDSCH allocation | | $n_{{\scriptscriptstyle PRB}}$ | 13—36 | - | 13—36 | - | 13—36 | - |
| Reference me defined in A.3 | PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2 | | R.6 TDD | | R.6 TDD | | R.6 TDD | |
| A.3.2.2.1 (OP. A.3.2.2.2 (OP. | 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 | 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_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA ^{Note2} OCNG_RB ^{Note2} | | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| $N_{oc}^{ m Note3}$ | Bands TDD_A Bands TDD_C Bands TDD_E | dBm/15 kHz | -1 | 06 | -86 -11 -11 | | 15 | |
| \hat{E}_s/N_{oc} | | dB | 6 | 1 | 6 | 1 | 3 | -1 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | | 2.5 | -6 | 2.5 | -6 | 0.5 | -5.76 |
| RSRP ^{Note4} | Bands TDD_A Bands TDD_C Bands TDD_E | dBm/15 kHz | -100 | -105 | -80 | -85 | -113 -112 -111 | -117 -116 -115 |
| | Bands TDD_A | | -70.27 | | -50.27 | | -82.43 | |
| lo ^{Note4} | Bands TDD_C | dBm/9 MHz | | | | | -81.43 | |
| | Bands TDD_E | | | | | | -80.43 | |
| Propagation condition | | - | AWGN | | AWGN | | AWGN | |
| Configuration | Correlation Matrix and Antenna | | 1) | | 1x1 | | 1x1 | |
| Note 1: For special subframe and | | Lunlink-downlink | configuratio | ne soo Ta | hlac / 2-1 | and 1 2-2 | in TC 26 2 | 11 |

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 ^{Note1} | | | | | | | | |
| OCNG_RB ^{Note} | | | | | | | | |
| | Bands FDD_A | | | | | | | 16 |
| | Bands FDD_B | | | | -103.85 | | | 5.5 |
| | Bands FDD_C | | | | | | | 15 |
| $N_{oc}^{ m Note2}$ | Bands FDD_D | ID /45111 | 0.4.70 | 04.70 | | -103.85 | -11 | 4.5 |
| oc . | Bands FDD_E, FDD_F Note 5 | dBm/15 kHz | -84.76 | -84.76 | | | -114 | |
| | Bands FDD G | | | | | | -113 | |
| | Note 7 Bands FDD_H | | | | | | -112.5 | |
| 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 |
| | Bands FDD_B | | | | | | -85 | 5.17 |
| Io ^{Note3} | Bands FDD_C | dBm/9 MHz | -50 | -50 | -73 | -73 | -84 | .67 |
| 10 | Bands FDD_D | אוווסו אוויסוא פיוויסט | -50 | -50 | -73 | -73 | -84 | .17 |
| | Bands FDD_E, FDD_F Note 5 | | | | | | -83 | 3.67 |
| L | ι υυ_Γ | | 1 | | 1 | | | |

| | Bands FDD_G Note 7 | | | | | | -82 | 2.67 |
|---|---------------------------|----|--------------|-------------|------------|------------|-----------|-------|
| | Bands FDD_H | | | | | | -82 | 2.17 |
| \hat{E}_s/N_{oc} | | dB | 3 | 3 | -2.9 | -2.9 | -4 | -4 |
| Propagat | ion condition | - | AW | 'GN | AW | GN | 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_{ee} 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 sh | | 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

A.9.2.2.1 Test Purpose and Environment

bandwidth within 865-894 MHz.

Except Band 29 and Band 32.

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 | | 5 |
| | | | | - | | | 1 | |
| | nent bandwidth | $n_{\it PRB}$ | 22—27 | | 22—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 | 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 | | -84.76 | -84.76 -103.85 | | -116 | | |
| oc oc | Bands TDD_C | dBm/15 kHz | | | 6 -103.85 | -103.85 | -115 | |
| | 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 | | | | | | -83.67 | |
| \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 FDD | |
| 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 | | | | | | | | |
| OCNG_RA ^{Note} | PDSCH_RB | | | | | | | |
| OCNG_RB ^{Note} | OCNC BBNote1 | | | | | | | |
| 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 | | | | | | -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_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 | | | | | | | |
| | 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 | | | | -75.46 | -75.46 | -89.26 | -89.76 |
| Io ^{Note3} | Bands FDD_C Bands FDD_D | dBm/9 MHz | -50 | -50 | | | -88.76 | -88.76 |
| | | 1 | | | | | | |
| | Bands FDD_E, FDD_F Note 5 | | | | | | -88.26 | -88.26 |

| | Bands FDD_G | | | | | | -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 | AWC | ΞN |
| Note 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 ce | ells and noise | sources no | t specified | in the test | is assumed | d to be const | ant over |
| | subcarriers and time and | shall be mode | lled as AW | GN of app | ropriate po | wer for N_{α} | c to be fulfill | ed. |
| Note 3: | RSRQ, RSRP and lo leve | els have been | derived fro | m other pa | rameters fo | or informati | on purposes | . They |
| | are not settable paramete | ers themselves | 5. | | | | | • |
| Note 4: | RSRP and RSRQ minimu | ım requiremen | its are spec | cified assur | ning indep | endent inte | rference and | I noise at |
| | each receiver antenna po | rt. | | | | | | |
| Note 5: | For Band 26, the tests sh | all be performe | ed with the | carrier free | quency of t | he assigne | d E-UTRA ch | nannel |
| | bandwidth within 865-894 MHz. | | | | | | | |
| Note 6: | Note 6: E-UTRA operating band groups are as defined in Section 3.5. | | | | | | | |
| Note 7: | Except Band 29 and Band | d 32. | | | | | | |

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 | amatar | 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 |
| | Gap Pattern Id Special subframe configuration Note1 | | 0 | - | 0 | - | 0 | - |
| | ne configuration k configuration Note1 | | 6 | | 6 | | 6 | |
| • | | | | | · | | · | |
| | ent bandwidth | n_{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 | $n_{{\scriptscriptstyle PRB}}$ | 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 | טטו | 100 |
| PBO | CH_RB | | | | | | | |
| | SS_RA | | | | | | | |
| | SS_RA | | | | | | | |
| | ICH_RB CH_RA | | | | | | | 0 |
| | CH RB | dB | 0 | 0 | 0 | 0 | 0 | |
| | CH_RA | 42 | | | | | | |
| | CH_RB | | | | | | | |
| | SCH_RA | | | | | | | |
| | SCH_RB G_RA ^{Note2} | | | | | | | |
| OCNO | 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

| Par | rameter | Unit | Tes | st 1 | Tes | t 2 | Tes | st 3 |
|-----------------------|--|--------------------------------|--------------|-------------|-------------|-------------|-------------|-------------|
| | | 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 | | 0 | <u>-</u> | 0 - | | 0 | - |
| | ne configuration Note1 | | | 6 | 6 | | 6 | |
| Uplink-downlin | k configuration Note1 | | - | 0 | 0 | | | - |
| | nent bandwidth | $n_{{\scriptscriptstyle PRB}}$ | 22- | –27 | 22— | -27 | 22- | –27 |
| | ence measurement ined in A.3.1.1.2 | | R.5 TDD | - | R.5 TDD | - | R.5 TDD | - |
| PDSCI | 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 | | | 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 | | | | | | | |
| | CH_RB | | | | | | | |
| | SS_RA | | | | | | | |
| | SS_RA | | | | | | | 0 |
| | FICH_RB ICH_RA | | | | 0 | | | |
| | ICH_RB | dB | 0 | 0 | | 0 | 0 | |
| | CCH_RA | uБ | | 0 | | 0 | | |
| PDC | CCH_RB | | | | | | | |
| | SCH_RA | | | | | | | |
| | SCH_RB | | | | | | | |
| OCN | G_RA ^{Note2} | | | | | | | |
| OCN | G_RB ^{Note2} | | | | | | | |
| $N_{oc}^{ m Note3}$ | Bands TDD_A | | | | | _ | -119.50 | -119.50 |
| oc oc | Bands TDD_C | dBm/15 kHz | -80 | -80 | -104.70 | 104.70 | -118.50 | -118.50 |
| | Bands TDD_E | | | | | | -117.50 | -117.50 |
| Ê | $E_{\rm s}/I_{ m ot}$ | 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 | | | | | | -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 |
| lo ^{Note4} | Bands TDD_C | dBm/9 MHz | -50 | -50 | -75.46 | -75.46 | -89.26 | -89.26 |
| | Bands TDD_E | | | | | | -88.26 | -88.26 |
| \hat{E}_{s} | $_{\rm s}/N_{oc}$ | dB | -1.75 | -1.75 | -4.0 | -4.0 | -4.0 | -4.0 |
| | tion condition | - | | /GN | AWO | | | 'GN |
| Note 1. For s | enacial subframe and | unlink-downlink | configuratio | ne saa Tal | Nec / 2-1 a | and 1 2-2 | in TS 36 2 | 11 |

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

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.

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.

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)

| Deverator | He!4 | 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 | $n_{\it PRB}$ | 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_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA 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 |
| Io ^{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 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.

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

| B | | | Tes | st 1 | |
|---|---|---------------|--|---|--|
| Param | | Units | Cell 1 | Cell 2 | Cell 3 |
| E-UTRA RF Channel N | Number | | 1 | 2 | 2 |
| BW _{channel_CA} Timeing offset to Cell 1 | | MHz | 10 | 10 | 10 |
| Time alignment error between cell 2 and cell 1 | | μѕ | - | 0 ≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1 | - |
| Measurement bandwid | lth | $n_{\it PRB}$ | 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_{PRB} | 13—36 | 13—36 | - |
| PDCCH/PCFICH/PHIC measurement channel | defined in A.3.1.2.1 | | R.6 FDD | R.6FDD | R.6 FDD |
| OCNG Patterns define FDD) and A.3.2.1.2 (O | | | 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_RA OCNG_RB POCNG_RB | | dB | 0 | 0 | 0 |
| $N_{oc}^{$ | Bands FDD_A 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 | -119.5 -119 -118.5 -118 -117.5 -116.5 -116 | -116 -115.5 -115 -114.5 -114 -113 -112.5 | -116 -115.5 -115 -114.5 -114 -113 -112.5 |
| \hat{E}_{s}/I_{ot} | | dB | -4.0 | -5.46 | -5.46 |
| 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 | -123.5 -123 -122.5 -122 -121.5 -120.5 -120 | -120 -119.5 -119 -118.5 -118 -117 -116.5 | -120 -119.5 -119 -118.5 -118 -117 -116.5 |
| RSRQ ^{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 Bands FDD_H Bands FDD_H | dB | -16.25 -90.26 | -17.34 -85.67 | -17.34 -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 | on 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 is achieved for all OFDM symbols. | | | | | |
| Note 2: | Interference from other cells and no | | | | | |
| | be constant over subcarriers and tir | me and shall | be modelled | as AWGN of | | |
| | appropriate power for N_{oc} to be fu | 16:111 | | | | |
| | | | | | | |
| Note 3: | RSRQ, RSRP and lo levels have be | | | ameters for i | ntormation | |
| | purposes. They are not settable pa | | | | | |
| Note 4: | RSRP and RSRQ minimum require | | | ning indepen | dent | |
| | interference and noise at each rece | | • | | | |
| Note 5: | The selection of the bands for testing | ng depends o | n the configu | ration of the | carrier | |
| | aggregation supported by the UEs | | | | | |
| Note 6: | For Band 26, the tests shall be perf | | | quency of the | assigned | |
| 1 | E-UTRA channel bandwidth within | | == | | | |
| Note 7: | This test verifies the RRM requirem | | | | andwidth | |
| | and is performed according to the principle defined in section A.3.6.1. | | | | | |
| Note 8: | E-UTRA operating band groups are | e as defined in | n 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 | |
|--|---------------------------------|--------------|----------------|---|-------------|
| | | | Cell 1 | Cell 2 | Cell 3 |
| E-UTRA RF Char BW _{channel} | inei ivuitiber | MHz | 1 | 2 10 | 2 |
| Timing offset to ce | ell 1 | μS | _ | 0 | 3 |
| Time alignment el and cell 1 | ror 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_{PRB} | | 22—27 | _ |
| PDSCH Reference channel defined in | | | 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 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_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RA POCNG_RB OCNG_RB | | dB | 0 | 0 | 0 |
| $N_{oc\ Note3}$ | Bands TDD_A | dBm/15 kHz | -119.5 | -11 | |
| | Bands TDD_C | UBIII/15 KHZ | -118.5 | -11 | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | Bands TDD_E | dB | -117.5 -4.0 | -11 -5.46 | -5.46 |
| L _s /L _{ot} | Bands TDD_A | QD | -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} | Bands TDD_A, TDD_C, TDD_E | dB | -16.25 | -17.34 | |
| | Bands TDD_A | | -90.26 | -85. | 67 |
| Io ^{Note4} | Bands TDD_C | dBm/9 MHz | -89.26 | -84. | 67 |
| | Bands TDD_E | | -88.26 | -83. | 67 |
| \hat{E}_s/N_{oc} | \hat{E}_s/N_{oc} 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_{oc} to be fulfilled. |
| | as AWGN of appropriate power for $\frac{\partial \mathcal{L}}{\partial \mathcal{L}}$ 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. |
| Nata O | |
| 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

| D | | 1124 | Tes | st 1 | Tes | st 2 | Tes | st 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 | 10 | | 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 | |
| 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 | | | | | -103.85 | | 15 |
| $N_{oc}^{ m Note2}$ | Bands FDD_D | dBm/15 kHz | 9.4 | -84.76 | | | | 4.5 |
| | Bands FDD_E, FDD_F Note 7 | UDIII/13 KI12 | 100.00 | | -10 | 3.00 | -114 | |
| | Bands FDD G | | | | | | -1 | 13 |
| | 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}_{s}/I_{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) | 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 |

| Propagation condition | - | AWGN | AWGN | AW | 'GN |
|------------------------------|---|------|------|--------|--------|
| Bands FDD_H | | | | -78.13 | -81.87 |
| Bands FDD_G Note 9 | | | | -78.63 | -82.37 |
| Bands FDD_E, FDD_F Note 7 | | | | -79.63 | -83.37 |
| Bands FDD_D | | | | -80.13 | -83.87 |

- 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 | | '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.9.2.8.2-2: Cell-specific test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time domain measurement resource restriction with non-MBSFN ABS

| Parameter | | Unit | Tes | st 1 | Test 2 | | Test 3 | |
|---|-------------------------------------|-------------------|-------------|-------------|-------------|-------------|----------------------------|----------------------------|
| | | | 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 | 1 | 0 |
| Measurement b | | n_{PRB} | | –27 | | –27 | | –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 | | | | _ | | _ | Note 6 | 0 |
| PDCCH_RA PDCCH_RB | | dB | 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 | | | | 400.05 | | -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 | | |
| | IG shall be used such | that both cells a | | | | | AWGN mitted 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: 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 | | '01000000100000001000 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 | | '00010000000100000001 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 | | '01000000100000001000 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

| _ | | | Tes | st 1 | Tes | st 2 | Tes | st 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 | | -84.76 | | | | | 15 |
| $N_{oc}^{ m Note2}$ | Bands FDD_D Bands FDD_E, | dBm/15 kHz | | | -103.85 | | -114.5 | |
| | FDD_F Note 8 | GBIII/ TO KI IZ | | | | | -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 | 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, |
| | | '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 |
| | | | MBSFN subframes. |
| Time-domain measurement | | | 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

| Dore | · · · · · · · · · · · · · · · · · · · | l lmit | Test 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 | | | - | | 1 | | 1 |
| BW _{channel} | | MHz | | 0 | 10 | | 10 | |
| Measurement ba | | $n_{\it PRB}$ | 22- | –27 | 22- | –27 | 22- | –27 |
| PDSCH Referen | in A.3.1.1.2 | | R.0 TDD | - | R.0 TDD | - | R.0 TDD | - |
| PDSCH allocation | on | n_{PRB} | 13—36 | - | 13—36 | - | 13—36 | - |
| PDCCH/PCFICH Reference meas defined in A.3.1. | surement channel | | 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 | defined in 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 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 Bands TDD_C | dBm/15 kHz | -84 | .76 | -103 | 3.85 | -1 | 16 15 |
| ^ / | Bands TDD_E | | | | | | -1 | 14 |
| CRS \hat{E}_s/N_{oc} | | dB | 5 | -2 | 5 | -2 | 5 | -4 |
| In the 1st OFDM | Note 5, 7 Symbol | dB | 2.88 | -8.19 | 2.88 | -8.19 | 3.54 | -10.19 |
| CRS $(\hat{E}_s/Iot)_m$ 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 |
| RSRP Note 3,4,5 | Bands TDD_A Bands TDD_C Bands TDD_E | dBm/15 kHz | -79.76 | -86.76 | -98.85 | -105.85 | -111 -110 -109 | -120 -119 -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 in the 1 st OFDM symbol | 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 |
| $(Io)_{meas}^{Note 3}$ in OFDM symbols other | Bands TDD_A Bands TDD_C | dBm/9 MHz | -50.17 | -54.85 | -69.26 | -73.94 | -81.63 -80.63 | -86.76 -85.76 |
| than the 1 st one | Bands TDD_E | | A144 | GN | A1A4 | GN | -79.63 | -84.76 |
| Propagation con | uiuOH | - | AVV | GIN | AVV | GIN | AVV | '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 |
|----------|---|
| 14010 2. | |
| | 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

| Donomotoro | | Test 1 | | | | | | | |
|---|--|-----------|--------------|--------------|--------------|--|--|--|--|
| P | 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 | | | | |
| PDSCH Reference measurement channel defined in A.3.1.1.1 | | | R.4 FDD | R.4 FDD | - | | | | |
| PDSCH a | allocation | n_{PRB} | 38-61 | 38-61 | - | | | | |
| Referenc | PDCCH/PCFICH/PHICH Reference measurement channel 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 | | | | | |
| N. a | Bands FDD_C Note 5 | dBm/18 | -86.26 | -81.67 | | | | | |
| Io ^{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 RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1. | | | | | | | | |
| Note 2: | Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves | | | | | | | | |
| Note 3: | See Table A.9.2.5.2-1 for the other parameters | | | | | | | | |
| Note 4: | E-UTRA operating | | | | | | | | |
| Note 5: | The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth. | | | | | | | | |

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

| Parameters | | Test 1 | | | | | | | |
|--|---|-----------|-------------|-------------|-------------|--|--|--|--|
| Par | | Units | Cell 1 | Cell 2 | Cell 3 | | | | |
| BW _{channel_CA} | Note1 | MHz | 20 | 20 | 20 | | | | |
| Measureme | ent bandwidth | n_{PRB} | 47-52 | 47-52 | 47-52 | | | | |
| measureme | DSCH Reference easurement channel efined in A.3.1.1.2 | | R.3 TDD | R.3 TDD | - | | | | |
| PDSCH allo | ocation | n_{PRB} | 38-61 | 38-61 | - | | | | |
| | FICH/PHICH measurement fined in | | R.10 TDD | R.10 TDD | R.10 TDD | | | | |
| | erns defined in DP.7 TDD) and DP.8 TDD) | | OP.7 TDD | OP.7 TDD | OP.8 TDD | | | | |
| | Bands TDD_A Note 5 | dBm/18 | -87.26 | -82.67 | | | | | |
| Io ^{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 themselves | | | | | | | | | |
| Note 3: See Table A.9.2.6.2-1 for the other parameters. | | | | | | | | | |
| | E-UTRA operating | | | | ction 3.5. | | | | |
| | The test applies for group which are s | | | | | | | | |

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

| Paran | neter | Unit | Value | Comment |
|--|--|------|---|---|
| PCell | | | Cell 1 | Serving/aggressor cell |
| Neighbour cells | | | Cell 2 | Neighbour/aggressor cell |
| | | | Cell3 | Cell to be measured |
| ABS transmission | n configuration | | 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 | | μѕ | 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. |
| resource restriction | Time domain measurement resource restriction pattern for neighbour cell measurements on 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. |
| Time-domain measurement resource restriction pattern for serving cell measurements | | | '010000000100000010000 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 | mbsfn- SubframeConfi gList | | oneFrame = '000000' | with subframe allocation <i>one</i> 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 | | |
|--|---|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 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 | annel Number | | | 1 | | | 1 | | | 1 | |
| BW _{channel} | | MHz | | 10 | | | 10 | | | 10 | |
| Measurement b | | n_{PRB} | | 22—27 | • | 22—27 | | 22—27 | | , | |
| channel defined | nce measurement d in A.3.1.1.1 | | | | R.0 FDD | | - | R.0 FDD | | - | |
| PDSCH allocat | ion | n_{PRB} | 13— 36 | | - | 13— 36 | | - | 13— 36 | | - |
| PDCCH/PCFIC Reference mea defined in A.3.1 | surement channel | | ı | R.6 FDI |) | R.6 FDD | | ı | R.6 FDI | 0 | |
| OCNG Patterns | | | OP. OP. OP.6 | | OP. | OP. | OP.6 | OP. | OP. | OP.6 | |
| A.3.2.1.5 (OP.5 | | | 5 | 6 | FDD | 5 | 6 | FDD | 5 FDD | 6FD D | FDD |
| A.3.2.1.6 (OP.6 PBCH_RA | (טעט) | | FDD | FDD | | FDD | FDD | | רטט | U | |
| PBCH_RB | | | | | | | | | | | |
| PSS_RA | | | | | | | | | | | |
| SSS_RA | | | | | | | | | | | |
| PCFICH_RB PHICH_RA | | | | | | | | | | | |
| PHICH_RB | | dB | Note | | 0 | Note | | 0 | Note 6 | | 0 |
| PDCCH_RA | | | 6 | | | 6 | | · · | | | |
| PDCCH_RB | | | | | | | | | | | |
| PDSCH_RA PDSCH_RB | | | | | | | | | | | |
| OCNG_RA Note | 1 | | | | | | | | | | |
| OCNG_RB Note | 1 | | | | | | | | | | |
| | Bands FDD_A | | | | | | | | -116 | | |
| | Bands FDD_B | | | | | | | | -115.5 | | |
| a a Nata O | Bands FDD_C Bands FDD_D | dBm/ | | | | | | | -115 -114.5 | | |
| $N_{oc}^{ m Note~2}$ | Bands FDD E. | 15 | -84.76 | | | -103.85 | | | | | |
| | FDD_F Note 7 | kHz | | • • | | | | -114 | | | |
| | Bands FDD_G Note 9 | | | | | | -113 | | | | |
| | Bands FDD_H | | | | | | | -112.5 | | | T |
| 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/ | - 90.7 | - 92.7 | - 06.0 | - | - | - 10F | 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 |
| I | 1 | l | 1 | <u> </u> | | l | l | <u> </u> | 1 | | |

| | Bands FDD_A | | | | | | - 80.8 2 | -85.03 | |
|-----------------------------|------------------------------|------------------|----------------|--------|------|--------|----------------|----------------|--------|
| | Bands FDD_B | dBm/ 9 MHz | | | | | | - 80.3 2 | -84.54 |
| | Bands FDD_C | | - 49.3 4 | -53.19 | 68.4 | -72.28 | - 79.8 2 | -84.04 | |
| (Io) _{meas} Note 3 | 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

| Para | meter | Unit | Value | Comment | | | | |
|--|-----------------------|------|---|---|--|--|--|--|
| PCell | | | Cell 1 | Serving/aggressor cell | | | | |
| Neighbour cells | | | Cell 2 | Neighbour/aggressor cell | | | | |
| | | | Cell3 | Cell to be measured | | | | |
| Special subfram | e configuration | | 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 | configuration | | | downlink subframe configurations see Table | | | | |
| | | | | 4.2-2 in [16]. | | | | |
| ABS transmission | on configuration | | 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 betw | veen cells | μs | Cell 2 offset with respect to | Three synchronous cells | | | | |
| | | | Cell 1: 0 | | | | | |
| | | | Cell 3 offset with respect to | | | | | |
| | | | Cell 1: -2.5 | 0 11 501 | | | | |
| Dhysiaal aall IDa | | | $(PCI_{cell1} - PCI_{cell3}) \mod 6 = 0$ | Cell PCIs are selected so that all conditions | | | | |
| Physical cell IDs | 5 | | (PCI _{cell2} - PCI _{cell3})mod6 != 0 | are met | | | | |
| | | | PCI _{cell1} not equal to PCI _{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 | | | | |
| 7 BO pattorn | | | 000000001000000001 | 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 demain me | a a a ura mant | | | measurement signalled to the UE in | | | | |
| Time domain me | | | | measSubframePatternNeigh IE in | | | | |
| resource restrict | neasurements on | | '000000001000000001' | measSubframePatternConfigNeigh, as | | | | |
| RF Channel 1 | leasurements on | | | defined in TS 36.331, clause 6.3.5. | | | | |
| Kr Channel i | | | | Provided to the UE for Cell 3 measurements. | | | | |
| | | | | The cell list in measSubframeCellList IE shall | | | | |
| | | | | contain Cell 3 but not Cell 2. | | | | |
| | | | | Configured for Cell 1 measurements. | | | | |
| Time-domain me | | | | | | | | |
| resource restriction pattern for serving cell measurements | | | '100000000100000000' | | | | | |
| | | | | | | | | |
| | 1 | | | | | | | |
| | physCellId | | see PCI conditions above | Only the CRS assistance information of cell 2 | | | | |
| CRS | antennaPortsC ount | | is provided for Cell 2 only in CRS- | | | | | |
| assistance | mbsfn- | | | AssistanceInfo. It includes a single MBSFN- | | | | |
| information | SubframeConfi | | oneFrame = '000000' | SubframeConfig element with subframe allocation one Frame='000000'. | | | | |
| | gList | | | anocation one manie- 000000. | | | | |
| L | 1 3 | | | 1 | | | | |

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 | Cell 3 | |
| E-UTRA RF Ch | E-UTRA RF Channel Number | | 1 | 1 | 3 | • | 1 2 3 | | 1 2 3 | | <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 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.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_RA POCNG_RB POCNG_RB | | dB | Note 6 | | 0 | Note 6 | | 0 | Note 6 | | 0 | |
| $N_{oc}^{ m Note2}$ | Bands TDD_A Bands TDD_C | | | -84.76 | | -103.85 | | -116 -115 | | | | |
| CRS \hat{E}_s/N_{oc} | Bands TDD_E | kHz dB | 4 | 2 | -1.5 | 4 | 2 | -1.5 | 4 | -114 2 | -4 | |
| $\frac{\sum_{s} I_{oc}}{\text{CRS}\left(\hat{E}_{s}/I_{ot}\right)}$ | | 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 | | - 49.3 -53 | | -53.19 | | - 3.4 -72.28 3 | | - 80.8 2 | -85 | 5.03 | |
| $(Io)_{meas}^{Note3}$ | Bands TDD_C | dBm/ 9 MHz | | | | | | | - 79.8 2 | -84.03 | | |
| | Bands TDD_E | | | | | | | | - 78.8 2 | -83 | 3.04 | |
| 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_{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 | Test 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 | neasurement channel | | 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 | -10 | 9.5 | |
| \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 |).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 | 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 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 |
| | Bands FDD_C | | | | | • | -118.5 | N/A |
| $N_{oc}^{ m Note2}$ | Bands FDD_D | | | | | | -118 | N/A |
| TV oc | Bands FDD_E, FDD_F Note 5 | dBm/15 kHz | -77 | -77 | -101.70 | 01.70 -101.70 | -117.5 | N/A |
| | Bands FDD_G | 1 | | | | | -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 | dBm/4.5 | | | | | -92.77 -92.27 | N/A N/A |
| Io ^{Note3} | Bands FDD_C Bands FDD_D | 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 | on condition | ı | AW | 'GN | AW | 'GN | AWC | 3N |
| Note 1: | OCNG shall be used such | n that both cell | s are fully | allocated a | nd a consta | ant total tra | nsmitted pov | ver |
| | spectral density is achieve | ed for all OFD | M symbols | | | | | |
| Note 2: | Interference from other co | ells and noise | sources no | t specified | in the test | is assumed | d to be consta | ant over |
| | | | | | | N | | |
| | subcarriers and time and | shall be mode | lled as AW | GN of app | ropriate po | wer for 🔭 | $^{\circ c}$ to be fulfill | ed. |
| Note 3: | RSRQ, RSRP and lo leve | els have been | derived fro | m other pa | rameters fo | or informati | on purposes | . They |
| | are not settable paramete | | | | | | | |
| Note 4: | RSRP and RSRQ minimu | ım requiremen | its are spec | cified assur | ning indep | endent inte | erference and | l noise at |
| | each receiver antenna port. | | | | | | | |
| Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-8 | | | | | 865-894 | | | |
| MHz. | | | | | | | | |
| Note 6: | This test is only applicable | e for testing in | ter-frequen | cy requirer | nents for B | ands FDD | _N. Cell 2 is | on the |
| | Band under test, and Cell | 1 is on another | er band su | oported by | the UE. | | | |

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

| Par | ameter | Unit | Te | | |
|---|---|---------------|----------|---------------|-------|
| Par | ameter | Unit | Cell 1 | Cel | l 2 |
| E-UTRA RF Chan | 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 | | - | | 0 | |
| PCFICH_RB | | + | | | |
| PHICH_RA | | - | | _ c | |
| PHICH_RB | | dB | 0 | _0 | |
| PDCCH_RA | | 1 45 | | _ 0 | 0 |
| PDCCH_RB | | | | _0 | 0 |
| PDSCH_RA | | | | | • |
| PDSCH_RB | | | | _0 | • |
| OCNG_RA ^{Note1} | | | | _ c | • |
| OCNG_RB ^{Note1} | | | | _0 | • |
| AllowedMeasBan | dwidth in TS 36.331 | RB | 6 | 5 | 0 |
| | PDSCH Reference measurement channel defined in A.3.1.1.1 | | R.0 FDD | - | |
| PDSCH allocation | 1 | 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_{PRB} | 0-49 | 0-21 28-49 | 22-27 |
| | | dB | -4 | -3 | 20 |
| RSRP ^{Note3} | | dBm/15 kHz | -98 | -9 | 0 |
| RSRQ ^{Note3} | | dB | -16.25 | - | |
| WB-RSRQ ₀ ^{Note3} ir | | dB | - | -13 | .68 |
| WB-RSRQ ₁ ^{Note3} in subframe ≠ 0 | | dB | - | -13 | .63 |
| lo ^{Note3} | | dBm/ 9 MHz | -64.76 | - | |
| lo ^{Note3} in symbol 0, 4, 11 of subframe 0 | | dBm/ 9 MHz | - | -82 | .38 |
| Io ^{Note3} in symbol 7 | | dBm/ 9 MHz | - | -82 | .20 |
| Io ^{Note3} in symbol 0 subframes ≠ 0 | , 4, 7, 11 of | dBm/ 9 MHz | - | -82.38 | |
| Propagation cond | | - | AWGN | AW | |
| Note 1: OCNG shall be used such that Cell 1 is fully allocated and a constant total | | | | | |

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

| | Test 1 | | | | | |
|--|--------------------|---------------|----------|---------------|-------|--|
| Para | meter | Unit | Cell 1 | Cel | 1 2 | |
| E-UTRA RF Chann | el Number | | 1 | 2 | | |
| BW _{channel} | | MHz | 10 | 1 | 0 | |
| Special subframe c | onfiguration Note1 | | 6 | 6 | ; | |
| Uplink-downlink cor | nfiguration Note1 | | 1 | 1 | | |
| Antenna Configurat | tion | | 1x2 | 1x | 2 | |
| Gap Pattern Id | | | 0 | - | | |
| PBCH_RA | | | | C | | |
| PBCH_RB | | | | C | | |
| PSS_RA | | | | C | | |
| SSS_RA | | | | C | | |
| PCFICH_RB | | | | 0 | | |
| PHICH_RA | | -ID | | _0 | | |
| PHICH_RB PDCCH_RA | | dB | 0 | 0 | | |
| PDCCH_RA | | - | | | | |
| PDSCH_RA | | | | | | |
| PDSCH_RB | | | | _ c | | |
| OCNG_RA ^{Note2} | | | | _0 | | |
| OCNG RB ^{Note2} | | | | | | |
| AllowedMeasBand | width in TS 36 331 | | | | | |
| [2] | Matrin 10 00.001 | RB | 6 | 5 | 0 | |
| PDSCH Reference | measurement | | D o TDD | | | |
| channel defined in | | | R.0 TDD | - | | |
| PDSCH allocation | | n_{PRB} | 13-36 | - | | |
| PDCCH/PCFICH/P measurement chan | | | R.6 TDD | - | | |
| A.3.1.2.2 OCNG Patterns def (OP.1 TDD) | fined in A.3.2.2.1 | | OP.1 TDD | - | | |
| I_{ot}^{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 | -9 | 0 | |
| 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 | - | -82 | .38 | |
| Io ^{Note4} in symbol 7 o | | dBm/ 9 MHz | - | -82 | .20 | |
| Io ^{Note4} in symbol 0, subframes ≠ 0 | | dBm/ 9 MHz | - | -82.38 | | |
| Propagation conditi | on | - | AWGN | AW | | |
| 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 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 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 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

| | | ı | | | |
|--------------------------------------|--|------------|-------------|---------------|--------------|
| Par | ameters | Units | Tes | t 1 Cell 2 | Cell 3 |
| BW _{channel} (| BW _{channel_CA} Note 1 | | 10 | Cell 2 | |
| | Measurement bandwidth | | 22-27 | | -15 |
| measurem | PDSCH Reference measurement channel defined in A.3.1.1.1 | | R.0 FDD | R.5 FDD | - |
| PDSCH al | location | n_{PRB} | 13-36 | 7-17 | - |
| Reference channel de A.3.1.2.1 | | | R.6 FDD | R.11 FDD | |
| in A.3.2.1. A.3.2.1.15 and | tterns defined 1 (OP.1 FDD), 5 (OP.15 FDD) | | OP.1 FDD | OP.15 FDD | OP.16 FDD |
| | Bands FDD A | | -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 |
| $N_{oc}^{$ | 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 |
| RSRP ^{Note2} | 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 | | | | |
| RSRQ ^{Note2} | Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Bands FDD_G | dB | -16.25 | -17.34 | -17.34 |

| | Bands FDD_H | | | | |
|---------------------|---|---------------------------------------|--------|--------|-----|
| | Bands FDD_N | | | | |
| | Bands FDD_A | | -90.26 | | |
| | Bands FDD_B | | -89.76 | | |
| | Bands FDD_C | | -89.26 | N/A | |
| | Bands FDD_D | dBm/9MHz | -88.76 | | |
| | Bands FDD_E, FDD_F | | -88.26 | | |
| | Bands FDD_G | -87.2 | -87.26 | | |
| | Bands FDD_H | | -86.76 | | |
| Io ^{Note2} | Bands FDD_A | | | -88.67 | |
| | Bands FDD_B | | | -88 | .17 |
| | Bands FDD_C | | | -87 | .67 |
| | Bands FDD_D | | | -87 | .17 |
| | Bands FDD_E, FDD_F | dBm/4.5MHz | N/A | -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 section RSRQ, RSRP are parameters for in | nd lo levels have nformation purpo | | | |
| Note 3: | parameters themselves. See Table A.9.2.5.2-1 for the other parameters | | | | |

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

| _ | | | Test 1 | | |
|------------------------|--|---------------------|----------------------------|-------------|--------------|
| | arameters | Units | Cell 1 | Cell 2 | Cell 3 |
| BW _{channel} | Note1 _CA | MHz | 10 | 5 | |
| Measure | ment bandwidth | n_{PRB} | 22-27 | 10- | 15 |
| measure | Reference ment channel n A.3.1.1.2 | | R.0 TDD | R.4TDD | - |
| PDSCH : | allocation | n_{PRB} | 13-36 | 7-17 | - |
| Reference | PCFICH/PHICH re measurement defined in | | R.6 TDD | R.1 TD | - |
| A.3.2.2.1 A.3.2.2.9 | atterns defined in (OP.1 TDD), (OP.9 TDD) and 0 (OP.10 TDD) | | OP.1 TDD | OP.9 TDD | OP.10 TDD |
| lo ^{Note2} | Bands TDD_A Bands TDD_C Bands TDD_E | dBm/9MHz | -90.26 -89.26 -88.26 | N/A | |
| 10 | Bands TDD_A Bands TDD_C dBm/4.5MHz N/A -87.67 Bands TDD E -86.67 | | | | |
| Note 1: | | | | | |
| Note 2: | 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 Military Military Military | Parai | meters | | Test | | |
|--|-----------------------|-----------------------|---------------|--------|--------|----------|
| Measurement bandwidth N _{PRB} 10-15 10-15 10-15 PDSCH Reference measurement channel defined in A.3.1.1.1 PDSCH allocatio□ | | | Units | Cell 1 | Cell 2 | |
| PDSCH Reference measurement channel defined in A.3.1.1.1 PDSCH allocation PDSCH PFICH/PHICH Reference measurement channel defined in A.3.1.2.1 CCNIQ Patterns defined in A.3.2.1.15 (OP.15 FDD) and A.3.2.1.15 (OP.15 FDD) and A.3.2.1.16 (OP.16 FDD) Bands FDD_B Bands FD | BVV channel_CA | | MHz | 5 | | 5 |
| PDCCH/PCFICH/PHICH R.11 FDD FDD FDD PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 PDC FDD R.11 FDD R.11 FDD FDD R.11 FDD | Measurement ba | andwidth | $n_{\it PRB}$ | | | 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) Rands FDD_B Bands FDD_C Bands FDD_B Bands FDD_C 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 | PDSCH allocation | on | n_{PRB} | 7-17 | 7-17 | - |
| Reference measurement channel defined in A.3.1.2.1 OCNG Patterns defined in A.3.2.1.16 (OP.15 FDD) and A.3.2.1.16 (OP.15 FDD) and A.3.2.1.16 (OP.15 FDD) Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_B | 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) FDD Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_E FDD_F FDD_F Bands FDD_A Bands FDD_B Bands FDD_B Bands FD | | | | | | R.11 FDD |
| Bands FDD_B Bands FDD_C Bands FDD_D F Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_N Bands FDD_N Bands FDD_D Bands FDD_B Bands FDD_D Bands FDD_B Bands FDD_D Bands FDD_B Ba | 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_N | | Bands FDD_B | | -119 | -115.5 | -115.5 |
| Bands FDD_E, FDD_F Bands FDD_G Bands FDD_D Bands FDD_D | | | | -118.5 | -115 | -115 |
| FDD_F Bands FDD_H Bands FDD_N Bands FDD_A Bands FDD_A Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D 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 Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_D Bands FDD_B | | 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_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_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 | | Bands FDD_H | | -116 | -112.5 | -112.5 |
| RSRPNote2 Bands FDD_B Bands FDD_C Bands FDD_E FDD_F Bands FDD_D Bands FDD | | Bands FDD_N | | -113 | -109.5 | -109.5 |
| RSRPNote2 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 Bands FDD_E Bands FDD_B Bands FDD_B Bands FDD_N | | Bands FDD_C | dBm/15 kHz | -122.5 | -119 | -119 |
| FDD_F Bands FDD_G Bands FDD_N Bands FDD_N Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_C 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_D Bands FDD_C Bands FDD_C Bands FDD_C 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_C Bands FDD_C Bands FDD_C Bands FDD_D Bands FDD_C Band | | 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_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_D 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_D Bands FDD_B | RSRP ^{Note2} | | | -121.5 | -118 | -118 |
| Bands FDD_N Bands FDD_A Bands FDD_B Bands FDD_C 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_A Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_D Bands FDD_C Bands FDD_B Bands FDD_C Bands FDD_B | | Bands FDD_G | | -120.5 | -117 | -117 |
| Bands FDD_A Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_A Bands FDD_A Note 5 Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Note 5 Bands FDD_B Ba | | Bands FDD_H | | -120 | -116.5 | -116.5 |
| Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_B FDD_E, FDD_F Bands FDD_H Bands FDD_N Bands FDD_A Note 5 Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D 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 Band | | Bands FDD_N | | -117 | -113.5 | -113.5 |
| RSRQ ^{Note2} Bands FDD_D Bands FDD_E 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_A Note 5 Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_B Bands FDD_N Bands | | 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_B Bands FDD_C Note 5 Bands FDD_B Bands FDD_C REST Bands FDD_G Bands FDD_G Bands FDD_H Note 5 Bands FDD_H Bands FDD_N Band | | Bands FDD_D | | | | |
| Bands FDD_G Bands FDD_N Bands FDD_N Bands FDD_A Bands FDD_B Note 5 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_E FDD_F Note 5 Bands FDD_G Bands FDD_H Bands FDD_H Bands FDD_N | | | 4 | | | |
| Bands FDD_N -93.26 -88.67 | | | | | | |
| Bands FDD_A Note 5 Bands FDD_B Note 5 Bands FDD_C Note 5 Bands FDD_C Bands FDD_D Bands FDD_B Bands FDD_B Bands FDD_G Bands FDD_G Bands FDD_G Bands FDD_H Note 5 Bands FDD_N Bands FDD_N Bands FDD_N Bands FDD_N Bands FDD_N | | | | | | |
| Bands FDD_B -93.26 -88.67 | | - | | | | |
| Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Bands FDD_G Bands FDD_H Bands FDD_H Bands FDD_N Bands FDD_N Bands FDD_N Bands FDD_N | | | | -93.26 | ï | 88.67 |
| Note 5 | | | | -92.76 | ï | 88.17 |
| Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 5 Bands FDD_H Note 5 Bands FDD_N Bands FDD_N ABARD | | | | -92.26 | - | 87.67 |
| Bands FDD_E, FDD_F Note 5 Bands FDD_G Note 5 Bands FDD_H Note 5 Bands FDD_N Bands FDD_N ABARD | | Bands FDD D | 1 | -91.76 | | 87.17 |
| Bands FDD_G Note 5 -90.26 -85.67 Bands FDD_H Note 5 -89.76 -85.17 | lo ^{Note2} | Bands FDD E. | dBm/4.5MHz | | - | |
| Note 589.70 -85.17 | | Bands FDD_G Note 5 | | -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

| Po | rameters | | Test 1 | | |
|--|--|----------------------------------|----------------------------|----------------------------|--------------|
| | | Units | Cell 1 | Cell 2 | Cell 3 |
| BW _{channel} | CA Note1 | MHz | 10 | 5 | 5 |
| Measuren | nent bandwidth | $n_{\it PRB}$ | 10-15 | 10-15 | 10-15 |
| PDSCH R measuren defined in | nent channel | | 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 |
| in A.3.2.2 | atterns defined .9 (OP.9 TDD) .2.10 (OP.10 | | 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 5: Note 4: Note 5: | E-UTRA operations of the test applies group which are bandwidth. | ng band groups for E-UTRA ope | are as defi erating ban | ned in Sec ds in this b | |

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

| 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 | $n_{{\scriptscriptstyle PRB}}$ | 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.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD | 5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD |
| PDSCH allo | | $n_{_{PRB}}$ | 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 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD | 5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD |
| A.3.2 | erns 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 |
| PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RE PHICH_RA PHICH_RB | 1 | dB | 0 | 0 |
| PDCCH_RE PDSCH_RA PDSCH_RB OCNG_RA ^N OCNG_RB ^N | N B Jote2 | | | |
| | Bands TDD_A | | - | -116 |
| | Bands TDD_C | | - | -115 |
| | Bands TDD_E | | - | -114 |
| | Bands FDD_A | | -119.5 | - |
| Natao | Bands FDD_B | | -119 | - |
| $N_{oc}^{ m Note3}$ | Bands FDD_C | dBm/15 kHz | -118.5 | - |
| | Bands FDD_D Bands FDD_E, Bands FDD_F Note 6 | | -118 -117.5 | - |
| | Bands FDD_G | | -116.5 | - |
| <u> </u> | Bands FDD_H | | -116 | - |
| \hat{E}_s/N_{oc} | | dB | -6.0 | -6.0 |
| \hat{E}_{s}/I_{ot} | T | dB | -6.0 | -6.0 |
| | Bands TDD_A | | - | -122 |
| | Bands TDD_C | | - | -121 |
| Note 4 | 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 | | -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 + |
| | | | | 10log(N _{RB,o} /50) |
| _ | Bands TDD_C | | - | -86.25 + |
| | | - | | 10log(N _{RB,c} /50) |
| | Bands TDD_E | | - | -85.25 + |
| | | | -90.75 + | 10log(N _{RB,c} /50) |
| | Bands FDD_A | | -90.75 ∓ 10log(N _{RB,} √50) | - |
| | Bands FDD B | | 89.76 | - |
| lo ^{Note4} | | alDirec/DVA/ | -89.75 + | |
| 10 | Bands FDD_C | dBm/BW _{channel} | 10log(N _{RB,} /50) | - |
| | D 1 500 0 | | -89.25 + | |
| | Bands FDD_D | | 10log(N _{RB,c} /50) | • |
| | Bands FDD_E, | | -88.75 + | |
| | Bands FDD_F Note | | 10log(N _{RB,} √50) | - |
| | 0 | | | |
| | Bands FDD G | | -87.75 + | - |
| | | - | 10log(N _{RB,} /50) | |
| | Bands FDD_H | | -87.25 + 10log(N _{RB.⊄} /50) | - |
| Propagation Condition | | | AWGN | AWGN |
| Antenna Configuration | | | 1x2 | 1x2 |
| Timing offset to Cell 1 | | μs | | 0 |
| Time alignm | ent error relative to | • | - | ≤ TAE |
| Note 1: For special subframe and unlink downlink configurations see Tables 4.2.1 and 4.2.2 in | | | | |

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: 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

| 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 | n ^{Note1} | | 6 | - |
| Uplink-downlink configuration Note1 | | | 1 | - |
| Measureme | nt bandwidth | $n_{{\scriptscriptstyle PRB}}$ | 5MHz: 10-15 10MHz: 22-27 20MHz: 47-52 | 5MHz: 10-15 10MHz: 22-27 20MHz: 47-52 |
| PDSCH Reformeasurement 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 | | n_{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 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD | 5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD |
| 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 |
| PBCH_RB PSS_RA SSS_RA PCFICH_RE PHICH_RA PHICH_RB | PSS_RA SSS_RA PCFICH_RB PHICH_RA | | 0 | 0 |
| PDCCH_RB PDSCH_RA PDSCH_RB | PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA ^{Note2} | | | |
| | Bands TDD_A | | -119.5 | - |
| | Bands TDD_C | | -118.5 | - |
| | Bands TDD_E | | -117.5 | - |
| | Bands FDD_A | | - | -116 |
| N Note3 | Bands FDD_B Bands FDD_C | -ID /4.5 - | <u>-</u> | -115.5 -115 |
| $N_{oc}^{ m Note3}$ | Bands FDD_D | dBm/15 kHz | <u> </u> | -114.5 |
| | Bands FDD_E, Bands FDD_F Note 6 | | - | -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_F | | | | | |
|---|-------------------------------|------------------------|---------------------------|------------------------------|------------------------------|
| Bands FDD_H | | Bands FDD F | | | -120 |
| Bands TDD_A Bands TDD_C Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_B Bands FDD_E Bands FDD_E Bands FDD_E Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands TDD_C Bands TDD_C Bands TDD_E Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_E Bands FDD_E Bands FDD_E Bands FDD_B Bands FDD_B | | Bands FDD_G | | - | -119 |
| Bands TDD_C Bands FDD_B Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_C Bands FDD_E Bands FDD_G Bands FDD_H Bands FDD_H Bands TDD_C Bands TDD_C Bands TDD_C Bands TDD_E Bands TDD_E Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_E Bands FDD_E | | Bands FDD_H | | - | -118.5 |
| RSRQNote4 Bands FDD_B Bands FDD_C Bands FDD_C Bands FDD_E Bands FDD_E Bands FDD_E Bands FDD_H | | Bands TDD_A | | | |
| Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_E Bands FDD_F Bands FDD_B Bands TDD_C Bands TDD_C Bands TDD_E Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_B | | Bands TDD_C | | -17.77 | - |
| Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Bands FDD_A Bands TDD_C Bands TDD_E 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_B Bands FDD_B | | Bands TDD_E | | | |
| RSRQ Bands FDD_C Bands FDD_D Bands FDD_E Bands FDD_G Bands FDD_G Bands FDD_H Bands FDD_A Bands FDD_A Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_D Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_B Ban | | | | | |
| Bands FDD_D Bands FDD_E Bands FDD_E Bands FDD_B Bands FDD_B Bands FDD_H Bands FDD_H Bands FDD_A Bands TDD_C Bands TDD_C 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_D Bands FDD_E Bands FDD_E Bands FDD_B B | | Bands FDD_B | | | |
| Bands FDD_E, Bands FDD_G | RSRO ^{Note4} | Bands FDD_C | dВ | | |
| Bands FDD_G Bands FDD_B Bands FDD_A Bands TDD_C Bands TDD_C 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_E Bands FDD_B Bands FDD_D Bands FDD_E Bands FDD_E Bands FDD_E Bands FDD_E Bands FDD_E Bands FDD_F Bands FDD_F Bands FDD_H Bands FDD_H Bands FDD_H Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_B Bands FDD_E Bands FDD_B Bands FDD_B | None | Bands FDD_D | uБ | | |
| Bands FDD_G Bands FDD_H -90.75 + 10log(N _{RB,} /50) - Bands TDD_C Bands TDD_E Bands FDD_A Bands FDD_B Bands FDD_D -89.75 + 10log(N _{RB,} /50) - Bands FDD_B Bands FDD_D Bands FDD_D Bands FDD_E, Bands FDD_F Note 6 dBm/BW _{channel} - -87.25 + 10log(N _{RB,} /50) - 85.17 - 86.25 + 10log(N _{RB,} /50) - -85.75 + 10log(N _{RB,} /50) - 85.75 + 10log(N _{RB,} /50) - -85.75 + 10log(N _{RB,} /50) - 85.25 + 10log(N _{RB,} /50) - -85.25 + 10log(N _{RB,} /50) - 85.25 + 10log(N _{RB,} /50) - -84.25 + 10log(N _{RB,} /50) - 83.75 + 10log(N _{RB,} /50) - -83.75 + 10log(N _{RB,} /50) - 83.75 + 10log(N _{RB,} /50) - - - 84.25 + 10log(N _{RB,} /50) - - - 83.75 + 10log(N _{RB,} /50) - - - 85.25 + 10log(N _{RB,} /50) - - - 85.25 + 10log(N _{RB,} /50) - - - 85.25 + 10log(N _{RB,} /50) - - | İ | | | - | -17.77 |
| Bands FDD_H | | Bands FDD_F Note 6 | | | |
| Bands FDD_H | | Bands FDD G | | | |
| Bands TDD_A Bands TDD_C Bands TDD_E Bands FDD_A Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_E Bands FDD_E Bands FDD_E Bands FDD_F Bands FDD_F Bands FDD_G Bands FDD_H Bands FDD_H Bands FDD_B Bands FDD_B | | | | | |
| Bands TDD_C | | Bands TDD_A | | | - |
| Bands TDD_E Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_E Bands FDD_E Bands FDD_E Bands FDD_E Bands FDD_F Bands FDD_G Bands FDD_H Bands FDD_H | | Danda TDD C | | | |
| Bands FDD_E Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_E Bands FDD_F Bands FDD_F Bands FDD_H Bands FDD_H | | Bands TDD_C | | 10log(N _{RB,c} /50) | • |
| Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_D Bands FDD_D Bands FDD_E Bands FDD_E Bands FDD_F Note 6 Bands FDD_H | | Bands TDD_E | | | - |
| Bands FDD_B | | Bands FDD A | | - | |
| Do Note Bands FDD_C Bands FDD_D - - - - - - - - - | | Bando i BB_/i | | | 10log(N _{RB,c} /50) |
| Bands FDD_D - - - - - - - - - | | Bands FDD_B | | | |
| Bands FDD_D | Io ^{Note4} | Bands FDD_C | dBm/BW _{channel} | - | |
| Bands FDD_E, Bands FDD_F | | Bands FDD_D | | - | -85.75 + |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | Bands FDD F | | - | -85.25 + |
| Bands FDD_H83.75 + 10log(N _{RB,ϕ} /50)Propagation ConditionAWGNAWGNAntenna Configuration1x21x2Timing offset to Cell 1μs-0 | | Bands FDD_G | | - | |
| Propagation Condition AWGN AWGN Antenna Configuration 1x2 1x2 Timing offset to Cell 1 μs - 0 | | Bands FDD_H | | - | -83.75 + |
| Timing offset to Cell 1 μs - 0 | Propagation Condition | | | AWGN | |
| | Antenna Configuration | | | 1x2 | 1x2 |
| Time alignment error relative to | | | μs | - | 0 |
| cell 1 Note 10 - ≤ TAE Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in | Time alignn 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 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: 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

| | | | Test 1 | | | |
|---|--|------------------------------|-------------|-------------|--------|--|
| Pa | rameters | Units | Cell 1 | Cell 2 | Cell 3 | |
| BW _{channel_C} | Note1 A | MHz | 20 | 1 | 10 | |
| Measurem | ent bandwidth | $n_{\scriptscriptstyle PRB}$ | 47-52 | 22 | -27 | |
| PDSCH Remeasurem | ent channel | | R.3 TDD | R.0 TDD | - | |
| PDSCH all | ocation | $n_{\scriptscriptstyle PRB}$ | 38-61 | 13-36 | - | |
| Reference | CFICH/PHICH measurement fined in A.3.1.2.2 | | R.10 TDD | R.6 | TDD | |
| A.3.2.2.7 (0 A.3.2.2.1 (0 | (| | OP.1 TDD | OP.2 TDD | | |
| | Bands TDD_A | ID (4004) | -87.26 | | / 0 | |
| | 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: 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 | | | | | | |

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

| | Parameter | Unit | Tes | |
|--|---|-----------------|----------------|----------------|
| | | Offic | Cell 1 | Cell 2 |
| | hannel Number | | | 1 |
| BW _{channel} | | MHz 10 | | |
| Measurement | bandwidth | $n_{\it PRB}$ | 22- | –27 |
| DMTC period | | ms N/A 160 | | |
| DMTC period | | ms | N/A | 10 |
| | nal occasion duration etween cell 1 and cell 2 | ms | N/A | 1 |
| | ence measurement channel defined in | μs | 0 R.0 | 2.3 |
| A.3.1.1.1 | ence measurement channel defined in | | FDD | - |
| PDSCH alloca | ation | n_{PRB} | 13—36 | - |
| | CH/PHICH Reference measurement | PRB | | FDD |
| CONG Pattern | ns defined in A.3.2.1.1 (OP.1 FDD) | | OP.1 | OP.2 |
| and A.3.2.1.2 | | | FDD | FDD |
| PBCH_RA | (0) = 1 = 2 | | | |
| PBCH_RB | | | | |
| PSS_RA | | | | |
| SSS_RA | | | | |
| PCFICH_RB PHICH_RA | | | | |
| PHICH_RB | | dB | 0 | 0 |
| PDCCH_RA | | uБ | | 0 |
| PDCCH_RB | | | | |
| PDSCH_RA | | | | |
| PDSCH_RB | 34 | | | |
| OCNG_RA ^{Note1} OCNG_RB ^{Note1} | | | | |
| | , ' | | | |
| $N_{oc}^{ m Note2}$ | Bands FDD_A | | -1 | 16 |
| | Bands FDD_B | | | 5.5 |
| | Bands FDD_C | dBm/15 kHz | | 15 |
| | Bands FDD_D Bands FDD_E, FDD_F Note 5 | abilii io ki iz | | 4.5 |
| | Bands FDD_E, FDD_F Bands FDD_G Note 7 | | <u> </u> | 14 13 |
| | Bands FDD_H | | <u> </u> | 2.5 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | | dB | -5.46 | -5.46 |
| RSRP ^{Note3} | Davida EDD A | 45 | | |
| RSRP | Bands FDD_A | | -120 -119.5 | -120 -119.5 |
| | Bands FDD_B Bands FDD_C | | -119.5 | -119.5 |
| | Bands FDD D | dBm/15 kHz | -118.5 | -118.5 |
| | Bands FDD E, FDD F Note 5 | | -118 | -118 |
| | Bands FDD_G Note 7 | | -117 | -117 |
| DOD C Note3 | Bands FDD_H | | -116.5 | -116.5 |
| RSRQ ^{Note3} | Bands FDD_A | | | |
| | Bands FDD_B Bands FDD_C | | | |
| | Bands FDD_C Bands FDD_D | dB | -17.34 | -17.34 |
| | Bands FDD E. FDD F Note 5 | 40 | 17.04 | 17.04 |
| | Bands FDD_G Note 7 | | | |
| | Bands FDD_H | | | |
| lo ^{Note3} | Bands FDD_A | | | .67 |
| | Bands FDD_B | | | .17 |
| | Bands FDD_C | dDm/0 MU- | † | .67 |
| | Bands FDD_D Bands FDD_E, FDD_F Note 5 | dBm/9 MHz | <u> </u> | .17 .67 |
| | Bands FDD_E, FDD_F Bands FDD_G Note 7 | | ł | .67 |
| | Bands FDD_G Bands FDD H | | 1 | 17 |
| \hat{E}_s/N_{oc} | | dB | -4 | -4 |
| | ondition. | <u> </u> | | 'GN |
| Propagation c | OHURION | - | AVV | GIN |

| Note 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 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 test.

Table A.9.2.29.2-1: RSRQ TDD Intra frequency test parameters

| | Daramatar | Unit | Test 1 | |
|--|-----------------------------------|---------------|------------------------|-----------|
| | Parameter | Unit | Cell 1 | Cell 2 |
| | hannel Number | | | 1 |
| BW _{channel} | Note1 | MHz | 10 | |
| Special subfra | me configuration ^{Note1} | | | 6 |
| Uplink-downlin | k configuration ^{Note1} | | | 1 |
| Measurement | bandwidth | n_{PRB} | 22 | <u>27</u> |
| DMTC period | | ms | N/A | 160 |
| DMTC period | | ms | N/A | 10 |
| Discovery signal occasion duration Time offset between cell 1 and cell 2 | | ms | N/A | 2 |
| Time offset between cell 1 and cell 2 | | μs | 0 | 2.3 |
| PDSCH Reference measurement | | | R.0 | _ |
| channel define | | | TDD | |
| PDSCH alloca | | n_{PRB} | 13—36 | - |
| | CH/PHICH Reference | | | |
| | channel defined in | | R.6 | S TDD |
| A.3.1.2.2 | defined in A.3.2.2.1 (OP.1 | | OP.1 OP.2 | |
| TDD) and A.3.2. | | | TDD | TDD |
| PBCH_RA | | | | |
| PBCH_RB | | | | |
| PSS_RA | | | | 0 |
| 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 | 1 | | |
| | Bands FDD_A | | - | 116 |
| $N_{oc}^{ m Note2}$ | Bands FDD_B | dBm/15 | -115.5 -115 -114 | |
| - · oc | Bands FDD_C | kHz | | |
| | Bands FDD_E | 1 | | |
| \hat{E}_{s}/I_{ot} | _ | dB | -5.46 | -5.46 |
| -s/-ot | Bands FDD A | | -120 | -120 |
| | Bands FDD_B | - ID. //.5 | -119.5 | -119.5 |
| RSRP ^{Note3} | Bands FDD_C | dBm/15 kHz | -119.5 | -119.5 |
| | Bands FDD_E | - NIZ | -118 | -118 |
| | Bands FDD_A | | 110 | 110 |
| | Bands FDD_A Bands FDD_B | | | |
| RSRQ ^{Note3} | Bands FDD_C | dB | -17.34 | -17.34 |
| | Bands FDD_E | | | |
| | Bands FDD_A | | -8 | 5.67 |
| lo ^{Note3} | Bands FDD_B | dBm/9 | | 5.17 |
| Bands FDD_C Bands FDD_E | | MHz | -84.67 | |
| | | | -83.67 | |
| \hat{E}_s/N_{oc} | | dB | -4 | -4 |
| Propagation co | ondition | - | A۱ | VGN |
| Note 1: For special subframe and uplink-downlink configurations se | | | | |

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

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: | 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. |

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

| | | | Tes | st 1 |
|--|--------------------------------|--------------------|----------------|----------------|
| | ameter | Unit | Cell 1 | Cell 2 |
| E-UTRA RF Chann | nel Number | | 1 | 2 |
| BW _{channel} | | MHz | 10 | 10 |
| Gap Pattern Id | | | 0 | - |
| Gap Offset | | ms | 9 | - |
| DMTC period | 1 | ms | - | 160 |
| DMTC period offset Discovery signal occasion duration | | ms | <u>-</u> | 10 1 |
| Time offset between | | ms | - , | <u>'</u> 3 |
| Measurement band | | μS | | -27 |
| PDSCH Reference | | n_{PRB} | 22. | -21 |
| channel defined in | | | R.0 FDD | - |
| PDSCH allocation | A.O. 1.1.1 | n | 13-36 | - |
| PDCCH/PCFICH/P | DUICH Deference | n_{PRB} | 13-30 | _ |
| measurement char | | | R 6 | FDD |
| A.3.1.2.1 | inor defined in | | 11.0 | |
| OCNG Patterns de | fined in A.3.2.1.1 | | 0D 4 EDD | OD 0 EDD |
| (OP.1 FDD) and A | .3.2.1.2 (OP.2 FDD) | | OP.1 FDD | OP.2 FDD |
| PBCH_RA | | | | |
| PBCH_RB | | 1 | | |
| PSS_RA | | | | |
| SSS_RA | | 4 | | |
| PCFICH_RB | | 4 | | |
| PHICH_RA | | - 40 | 0 | 0 |
| PHICH_RB | | dB | 0 | 0 |
| PDCCH_RB | PDCCH_RA | | | |
| PDSCH_RA | | | | |
| PDSCH RB | | - | | |
| OCNG_RA ^{Note1} | | | | |
| OCNG_RB ^{Note1} | | 1 | | |
| | Bands FDD_A | | -117.5 | -117.5 |
| | Bands FDD_B |] [| -117 | -117 |
| | Bands FDD_C | | -116.5 | -116.5 |
| $N_{oc}^{ m Note2}$ | Bands FDD_D | dBm/15 | -116 | -116 |
| | Bands FDD_E, FDD_F Note 5 | kHz | -115.5 | -115.5 |
| | FDD_F Note 7 | - | 444.5 | 444.5 |
| | Bands FDD_G Note 7 Bands FDD_H | - | -114.5 -114 | -114.5 -114 |
| - | Dalius FDD_IT | | -114 | -114 |
| $\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | | dB | -6 | -6 |
| | Bands FDD_A | | -123.5 | -123.5 |
| | Bands FDD_B | <u> </u> | -123 | -123 |
| | Bands FDD_C | <u> </u> | -122.5 | -122.5 |
| RSRP ^{Note3} | Bands FDD_D | dBm/15 | -122 | -122 |
| _ | Bands FDD_E, FDD_F Note 5 | kHz | -121.5 | -121.5 |
| | Pondo FDD C Note 7 | 4 | | |
| | Bands FDD_G Note 7 Bands FDD_H | - | -120.5 | -120.5 |
| | Bands FDD_H Bands FDD_A | | -120 | -120 |
| | Bands FDD_B | ┪ ┃ | | |
| | Bands FDD_C | 1 | | |
| DOD O Note3 | Bands FDD_D | † <u>.</u> | . | |
| RSRQ ^{Note3} | | dB | -17.77 | -17.77 |
| | Bands FDD_E, FDD_F Note 5 | _ | | |
| | Bands FDD_G Note 7 | | | |
| | Bands FDD_H | | | |
| | Bands FDD_A | | -88.75 | -88.75 |
| Noto? | Bands FDD_B | dBm/9 | -88.25 | -88.25 |
| Io ^{Note3} | Bands FDD_C | - MHz | -87.75 | -87.75 |
| | Bands FDD_D | ا ''''' <u>'</u> ا | -87.25 | -87.25 |
| | Bands FDD_E, | | -86.75 | -86.75 |

| | 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: | | | | |
| | transmitted power spectral dens | | | |
| Note 2: | Interference from other cells and | | | |
| | assumed to be constant over su | bcarriers and | d time and shall be i | 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 not settable parameters themselves. | | | |
| Note 4: | RSRP and RSRQ minimum requ | | | |
| | interference and noise at each receiver antenna port. | | | |
| Note 5: | Note 5: For Band 26, the tests shall be performed with the carrier frequency of the | | | ncy of the |
| | assigned E-UTRA channel bandwidth within 865-894 MHz. | | | - |
| Note 6: | · · · · · · · · · · · · · · · · · · · | | | |
| 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

| Parameter | | Unit | Test 1 | |
|--------------------------------------|--|------------------------|--------------------|--------------------|
| | | Offic | Cell 1 | Cell 2 |
| E-UTRA RF Chan | nel Number | | 1 | 2 |
| BW _{channel} | | MHz | 10 | 10 |
| Gap Pattern Id | | | 9 | - |
| Gap Offset DMTC period | | mo | 9 | 160 |
| DMTC period offse | ot . | ms ms | | 100 |
| Discovery signal of | | ms | _ | 2 |
| Time offset between cells | | μς | 0 | 3 |
| Special subframe | | μο | | 5 5 |
| Uplink-downlink co | onfiguration Note1 | | • | 1 |
| Measurement ban | | $n_{\it PRB}$ | 22- | -27 |
| PDSCH Reference | e measurement channel | TRD | | |
| defined in A.3.1.1. | | | R.0 TDD | - |
| PDSCH allocation | | $n_{\it PRB}$ | 13—36 | - |
| PDCCH/PCFICH/I | | | R.6 | TDD |
| | nnel defined in A.3.1.2.2 efined in A.3.2.2.1 (OP.1 | | | I |
| TDD) and A.3.2.2. | | | OP.1 TDD | OP.2 TDD |
| PBCH_RA | 2 (01 .2 100) | | | |
| PBCH_RB | | | | |
| PSS_RA | | | | 0 |
| SSS_RA | | | | |
| PCFICH_RB | | | | |
| PHICH_RA | | | 0 | |
| PHICH_RB | | dB | | |
| PDCCH_RA | | | | |
| PDCCH_RB | | | | |
| PDSCH_RA | | | | |
| PDSCH_RB OCNG_RA ^{Note2} | | | | |
| OCNG_RA OCNG RB ^{Note2} | | | | |
| _ | Bands TDD A | | -117.50 | -117.50 |
| $N_{oc}^{ m Note3}$ | Bands TDD C | dBm/15 kHz | -116.50 | -116.50 |
| | Bands TDD E | 3511, 10 KHZ | -115.50 | -115.50 |
| \hat{E}_{s}/I_{ot} | Burido 188_E | dB | -6.0 | -6.0 |
| L _s /I _{ot} | Panda TDD A | ub_ | | |
| RSRP ^{Note4} | Bands TDD_A Bands TDD_C | dBm/15 kHz | -123.50 -122.50 | -123.50 -122.50 |
| KSKP | Bands TDD_E | UDIII/13 KHZ | | |
| | | | -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 condi | tion | - | AW | 'GN |
| | ecial subframe and uplink-d | lownlink configuration | | |

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.9.2.31.3 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 |
| $\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$ | | 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 | 17.54 | 17.04 |
| | Bands FDD_E, FDD_F Note 6 | <u></u> | | | |

| | Bands FDD_G | | | | | |
|---|---|--------------|--------|--------|--------|--|
| | Bands FDD_H | 1 | | | | |
| | Bands FDD_A | dBm/9 MHz | -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 | | -88.76 | -84.17 | -84.17 | |
| 10 | 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} | \hat{E}_s/N_{oc} | | -4.0 | -4.0 | -4.0 | |
| 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: | | | | | | |
| | be constant over subcarriers and time and shall be modelled as AWGN of | | | | | |
| appropriate power for N_{oc} to be fulfilled. | | | | | | |
| Note 3: | | | | | | |
| Note 3. | RSRQ, RSRP and lo levels have been derived from other parameters for information | | | | | |
| Note 4: | purposes. They are not settable parameters themselves. | | | | | |
| NOIG 4. | RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | |
| Note 5: | | | | | | |
| 11010 0. | aggregation supported by the UEs | | | | | |
| Note 6: | | | | | | |
| | 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 groups are as defined in Section 3.5. | | | | | |

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 intra-frequency RSRQ measurements between Cell 2 and 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 | Unit | Test 1 | | | | |
|---|-------------------------------|-----------------|---|---------------------|------------|--|
| | Onit | Cell 1 | Cell 2 | Cell 3 | | |
| E-UTRA RF Chan | nel Number | N 41 1- | 1 | 2 2 | | |
| BW _{channel} | | MHz | NI/A | 10 | | |
| | DMTC period offeet | | N/A N/A | N/A N/A | 160 10 | |
| DMTC period offset Discovery signal occasion duration | | | N/A | N/A N/A | 10 | |
| Timing offset to cell 1 | | μs | - | 0 | 3 | |
| Time alignment er and cell 1 | μυ | - | ≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1 | - | | |
| Special subframe | configuration Note1 | | | 6 | | |
| Uplink-downlink c | onfiguration ^{Note1} | | 1 | | | |
| Measurement bar | n_{PRB} | | 22—27 | | | |
| PDSCH Referenc | | | R.0 TDD | R.0 TDD | - | |
| PDSCH allocation | 1 | n_{PRB} | 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 d (OP.1 TDD) and A 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 PDSCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB OCNG_RB | | dB | 0 | 0 | 0 | |
| $N_{oc\ { m Note3}}$ | Bands TDD_A | dBm/15 kHz | -119.5 | -116 | | |
| | Bands TDD_C | | -118.5 | -115 | | |
| $\begin{array}{ c c c }\hline & BandsTDD_E\\\hline \hat{E}_{_{s}}/I_{_{\mathrm{ot}}} \end{array}$ | | dB | -117.5 -4.0 | -114 -5.46 -5.40 | | |
| 37 01 | Bands TDD_A | | -123.50 | -120 | -120 | |
| RSRP ^{Note4} | Bands TDD_C | dBm/15 kHz | -122.50 | -119 | -119 | |
| | Bands TDD_E | 32.11/10 KI12 | -121.50 | -118 | -118 | |
| RSRQ ^{Note4} | Bands TDD_A, TDD_C, TDD_E | dB | -16.25 | -17.34 | | |
| | Bands TDD_A | | -90.26 | -85.67 | | |
| lo ^{Note4} | Bands TDD_C | dBm/9 MHz | -89.26 | -84.67 | | |
| | Bands TDD_E | SEII, O IVII IZ | -88.26 | -83.67 | | |
| \hat{E}_s/N_{oc} | | 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_{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 intra-frequency RSRQ measurements between Cell 2 and 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 Time offset between | | | 1x2 | |
| Measurement ban | | μS | 3 22-27 | |
| PDSCH Reference | | $n_{\scriptscriptstyle PRB}$ | | |
| 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 | | ï | | 0 |
| PSS_RA SSS_RA | | | | 0 |
| PCFICH_RB | | | | _∞ |
| PHICH_RA | | | | -∞ |
| PHICH_RB | | dB | 0 | _∞ |
| PDCCH_RA | | <u> </u> | | -∞ |
| PDCCH_RB | | | | -∞ |
| PDSCH_RA | | | | -∞ |
| PDSCH_RB | | | | -∞ |
| OCNG_RA ^{Note1} | | | | -∞ |
| OCNG_RB ^{Note1} | | | | -∞ |
| I Note2 | Symbols with CRS, | -ID /4 <i>E</i> | -103.85 | -103.85 |
| $I_{ot}^{$ | PSS, SSS or PBCH All the other | dBm/15 kHz | | |
| | symbols | | -94.75 | -94.75 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | c)c.c | dB | -3 | -3 |
| $\mathbf{L}_{\mathrm{s}}/1_{\mathrm{ot}}$ | | | -3 | -5 |
| RSRP ^{Note3} | | dBm/15 kHz | -106.85 | -106.85 |
| | Subframe 0 | dB | -14.54 | -14.54 |
| RSRQ ^{Note3} | Subframes other | | -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 | dBm/ 9 MHz | -75.72 | -75.72 |
| lo in subframe 5 ^{Note3} | Symbol 1/2/3/8/9/10/12/13 | | -66.97 | -66.97 |
| 5 | Symbol 5/6 | | -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 | | | |

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.

RSRP and RSRQ minimum requirements are specified assuming independent.

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 | Tes | st 1 |
|--|----------------------------------|---------------|------------------|------------------|
| Para | ameter | Unit | Cell 1 | Cell 2 |
| E-UTRA RF Chann | el Number | | 1 | 2 |
| BW _{channel} | r . Note1 | MHz | 10 | 10 |
| Special subframe of Uplink-downlink co | onfiguration Note1 | | 6 | 6 |
| Gap Pattern Id | ntiguration | | <u>1</u> 0 | 1 |
| Antenna Configura | tion | | 1x2 | 1x2 |
| Time offset betwee | | μs | | 3 |
| Measurement band | | n_{PRB} | | -27 |
| 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 | | | |
| measurement char | nel defined in | | R.6 TDD | - |
| A.3.1.2.2 | | | | |
| 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 PDSCH_RB | | | | -∞ |
| OCNG_RA ^{Note1} | | | | -∞ |
| OCNG_RB ^{Note1} | | | | -∞ |
| _ | Symbols with CRS, | | 100.05 | |
| $I_{ot}^{ m Note2}$ | 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 | NI IZ | -14.54 | -14.54 |
| RSRQ ^{Note3} | Subframes other | dB | -14.14 | -14.14 |
| | than 0 Subframe 0 | | -20.08 | -20.08 |
| | Subframe 5 | dB | -21.31 | -21.31 |
| New RSRQ ^{Note3} | Subframe 1 or 6 | | -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 7 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 | -75.72 |
| or 6 ^{Note3} | Symbol 1/3/5/6/8 Symbol 2 | MHz | -66.97 -75.81 | -66.97 -75.81 |
| | Symbol 0/4/7/11 | | -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

| Test 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 | 12 | 13—36 | _ | | |
| PDCCH/PCFICH/PHICH Reference | n_{PRB} | 13—30 | | | |
| measurement channel defined in A.3.1.2.1 | | 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.2 FDD | | |
| PBCH_RA | | | | | |
| PBCH_RB | | | | | |
| PSS_RA | ļ | | | | |
| SSS_RA | ļ | | | | |
| PCFICH_RB | | | | | |
| PHICH_RA PHICH RB | -ID | 0 | 0 | | |
| PDCCH_RA | dB | 0 | 0 | | |
| PDCCH_RB | } | | | | |
| PDSCH_RA | } | | | | |
| PDSCH_RB | | | | | |
| OCNG_RA ^{Note1} | 1 | | | | |
| OCNG RB ^{Note1} | 1 | | | | |
| $N_{oc}^{ m Note2}$ | 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 to | | | | | |
| 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, RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. 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 | | | |
|--|---|---------------------|----------------|--|--|
| | 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_{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 | | R.6 | TDD | | |
| OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) | | OP.1 TDD | OP.2 TDD | | |
| PBCH_RA | ļ | | | | |
| PBCH_RB | ļ | | | | |
| PSS_RA | ļ | | | | |
| SSS_RA | <u> </u> | | | | |
| PCFICH_RB | | | | | |
| PHICH_RA | I.D. | | 0 | | |
| PHICH_RB | dB | 0 | 0 | | |
| PDCCH_RA | - | | | | |
| PDCCH_RB | <u> </u> | | | | |
| PDSCH_RA | <u> </u> | | | | |
| PDSCH_RB OCNG_RA ^{Note1} | 1 | | | | |
| OCNG_RA OCNG_RB ^{Note1} | { | | | | |
| | 15 /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 | | |
| lo ^{Note3} | dBm/ 9 MHz | -50 | -50 | | |
| \hat{E}_s/N_{oc} | dBm/ 9 MHz | -1.75 | -1.75 | | |
| Propagation condition | - | AW | - | | |
| Note 1: For special subframe and uplink 4.2-2 in TS 36.211. | c-downlink co | nfigurations see Ta | bles 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 | | | | | |
| Note 4: RSRP, RSRQ and lo levels hav information purposes. They are | AWGN of appropriate power for 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. The RSRQ | | | | |
| values assume RSSI averaging Note 5: RSRP and RSRQ minimum req interference and noise at each r | uirements are | e specified assumin | | | |

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 | - | - |

| | Bands | | | | |
|-----------------------|--------------------|-------------------------------|--|---|--|
| | FDD_E, | | 400 5 | | |
| | 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 | | | | |
| Note 4 | Bands FDD_C | | | | |
| RSRQ ^{Note4} | Bands FDD_D | dB | | | |
| | Bands | | -17.77 | _ | _ |
| | FDD_E, | | | | |
| | Bands FDD_F | | | | |
| | Bands FDD_G | | | | |
| | Bands FDD_H | | | | |
| | Bands TDD_A | | _ | -87.25 + | -87.25 + |
| | Bando 1BB_71 | | | 10log(N _{RB,c} /50) | 10log(N _{RB,o} /50) |
| | Bands TDD_C | dBm/ BW _{channel} | - | -86.25 + | -86.25 + |
| | | | | 10log(N _{RB,d} /50) | 10log(N _{RB,c} /50) |
| | Bands TDD_E | | - | -85.25 + 10log(N _{RB,} √50) | -85.25 + 10log(N _{RB,c} /50) |
| | Bands FDD_A | | -90.75 + | _ | _ |
| | Danas i DD_it | | 10log(N _{RB,c} /50) | | |
| | Bands FDD B | | -90.25 + | _ | - |
| | | | 10log(N _{RB,o} /50) | | |
| Io ^{Note4} | Bands FDD_C | | -89.75 + | - | - |
| | | | 10log(N _{RB,} /50) -89.25 + | | |
| | Bands FDD_D | | 10log(N _{RB,c} /50) | - | - |
| | Bands | | | | |
| | FDD_E, | | -88.75 + | _ | - |
| | Bands FDD_F | | 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 | | | AWGN | AWGN | AWGN |
| Antenna Con | | | 1x2 | 1x2 | 1x2 |
| Timing offset | | μs | - | 0 | 0 |
| Time alignme | ent error relative | | - | ≤TAE | ≤TAE |
| to cell 1 Note 10 | | | | _ 1715 | / _ |
| to cell 2 Note 10 | ent error relative | | ≤TAE | - | ≤TAE |
| to cell 2 | | | | | |

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.
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, | TORTIZ | | | -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, Bands FDD_F Note 6 | | - | -120 | -120 |
|-------------------------------|---------------------------------------|---------------------------------|------------------------------|------------------------------|------------------------------|
| | Bands FDD_G | | - | -119 | -119 |
| | Bands FDD_H | | - | -118.5 | -118.5 |
| | Bands TDD_A | | | | |
| | Bands TDD C | | -17.77 | - | _ |
| | Bands TDD_E | | | | |
| | Bands FDD_A | | | | |
| | Bands FDD_B | | | | |
| Note4 | Bands FDD_C | | | | |
| RSRQ ^{Note4} | Bands FDD_D | dB | | | |
| | Bands FDD_E, | | - | -17.77 | -17.77 |
| | Bands FDD_F Note 6 | | | | |
| | Bands FDD_G | | | | |
| | Bands FDD_H | | | | |
| | _ | | -90.75 + | | |
| | Bands TDD_A | | 10log(N _{RB,c} /50) | - | - |
| | 5 | - dBm/ BW _{channel} | -89.75 + | | |
| | Bands TDD_C | | 10log(N _{RB,o} /50) | - | - |
| | D TDD E | | -88.75 + | | |
| | Bands TDD_E | | 10log(N _{RB,c} /50) | - | - |
| | Danda EDD A | | 3 ,, | -87.25 + | -87.25 + |
| | Bands FDD_A | | - | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| | Dondo EDD D | | | -86.75 + | -86.75 + |
| | Bands FDD_B | | - | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| Io ^{Note4} | Bondo EDD C | | - | -86.25 + | -86.25 + |
| | Bands FDD_C | | | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| | Bands FDD_D | | | -85.75 + | -85.75 + |
| | Ballus PDD_D | | - | 10log(N _{RB,c} /50) | 10log(N _{RB,o} /50) |
| | Bands FDD_E, | | | -85.25 + | -85.25 + |
| | Bands FDD_F | | - | 10log(N _{RB,o} /50) | 10log(N _{RB,c} /50) |
| | Note 6 | | | | |
| | Bands FDD_G | | _ | -84.25 + | -84.25 + |
| | Danus i DD_G |] | - | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| | Bands FDD_H | | _ | -83.75 + | -83.75 + |
| | | | - | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| Propagation | | | AWGN | AWGN | AWGN |
| Antenna Co | | | 1x2 | 1x2 | 1x2 |
| Timing offse | | μs | | 0 | 0 |
| Time alignm to cell 1 Note | ent error relative | | - | ≤TAE | ≤TAE |
| Time alignm | ent error relative | | ≤TAE | _ | ≤TAE |
| to cell 2 Note | 10 | | 2 IAL | | 2 IAL |

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.
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.9.2.39.3 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

| | rameter | Unit | Cell 1 | Cell 2 | Cell 3 |
|--------------------------------------|------------------------------|--------------------------------|---|---|---|
| E-UTRA RF C | nannel Number | | 1 | 2 | 3 |
| BWchannel | | MHz 10MHz: | $5MHz:N_{RB,c} = 25$ $10MHz:N_{RB,c} = 50$ | 5MHz: N _{RB,c} = 25 10MHz: N _{RB,c} = 50 | $5MHz: N_{RB,c} = 25$ $10MHz: N_{RB,c} = 50$ |
| | | IVII IZ | $20MHz:N_{RB,c} = 100$ | $20MHz: N_{RB,c} = 100$ | 20MHz: N _{RB,c} = 100 |
| | | | 5MHz:10-15 | 5MHz: 10-15 | 5MHz: 10-15 |
| Measurement I | bandwidth | $n_{{\scriptscriptstyle PRB}}$ | 10MHz:22-27 | 10MHz: 22-27 | 10MHz: 22-27 |
| | | FKB | 20MHz:47-52 | 20MHz: 47-52 | 20MHz: 47-52 |
| PDSCH Refere | ence measurement | | 5MHz:R.5 FDD | 5MHz:R.5 FDD | 5MHz:R.5 FDD |
| channel define | | | 10MHz:R.0 FDD | 10MHz:R.0 FDD | 10MHz:R.0 FDD |
| onarmor domio | G 1117 11.01 11.111 | | 20MHz:R.4 FDD | 20MHz:R.4 FDD | 20MHz:R.4 FDD |
| DDCCH alleged | tion | ** | 5MHz:7-17 | 5MHz:7-17 | 5MHz:7-17 |
| PDSCH allocat | lion | $n_{{\scriptscriptstyle PRB}}$ | 10MHz:13-36 20MHz:38-61 | 10MHz:13-36 20MHz:38-61 | 10MHz:13-36 20MHz:38-61 |
| PDCCH/PCFIC | CH/PHICH | | 5MHz:R.11 FDD | 5MHz:R.11 FDD | 5MHz:R.11 FDD |
| | asurement channel | | 10MHz:R.6 FDD | 10MHz:R.6 FDD | 10MHz:R.6 FDD |
| defined in A.3. | | | 20MHz:R.10 FDD | 20MHz:R.10 FDD | 20MHz:R.10 FDD |
| | | | 5MHz:OP.15 FDD | 5MHz:OP.15 FDD | 5MHz:OP.15 FDD |
| OCNG Pattern A.3.2.1 | s defined in | | 10MHz:OP.1 FDD | 10MHz:OP.1 FDD | 10MHz:OP.1 FDD |
| A.3.2.1 | | | 20MHz:OP.11 FDD | 20MHz:OP.11 FDD | 20MHz:OP.11 FDD |
| PBCH_RA | | | | | |
| PBCH_RB | | | | | |
| PSS_RA | | | | | |
| SSS_RA | | | | | |
| PCFICH_RB | | | | | |
| PHICH_RA | | | | | |
| PHICH_RB | | dB | 0 | 0 | 0 |
| PDCCH_RA | | <u></u> | · | | · · |
| PDCCH_RB | | | | | |
| PDSCH_RA | | | | | |
| _ | | | | | |
| PDSCH_RB OCNG_RA ^{Note1} | Ι | | | | |
| OCNG_RA | | | | | |
| OCNG_RB | _ | | 440.5 | 440 | 440 |
| | Bands FDD_A Bands FDD_B | | -119.5 -119 | -116 -115.5 | -116 -115.5 |
| | Bands FDD_B Bands FDD_C | | -118.5 | -115.5 | -115.5 |
| Note? | Bands FDD_C | dBm/15 | -118 | -114.5 | -114.5 |
| $N_{oc}^{ m Note2}$ | Bands FDD E. | kHz | | | |
| | FDD_F Note 6 | | -117.5 | -114 | -114 |
| | Bands FDD_G | | -116.5 | -113 | -113 |
| | Bands FDD_H | | -116 | -112.5 | -112.5 |
| \hat{E}_s/N_{oc} | | dB | -6.0 | -6.0 | -6.0 |
| s / OC | | | | | |
| $\hat{E}_{_{s}}/I_{_{ot}}$ Note3 | | dB | -6.0 | -6.0 | -6.0 |
| | Bands FDD_A | | -125.5 | -122 | -122 |
| | Bands FDD_B | | -125 | -121.5 | -121.5 |
| | Bands FDD_C | | -124.5 | -121 | -121 |
| RSRP ^{Note3} | Bands FDD_D | dBm/15 | -124 | -120.5 | -120.5 |
| | Bands FDD_E, FDD_F Note 6 | kHz | -123.5 | -120 | -120 |
| | Bands FDD_G | | -122.5 | -119 | -119 |
| | Bands FDD_H | | -122 | -118.5 | -118.5 |
| | Bands FDD_A | | | | |
| | Bands FDD_B | | | | |
| | Bands FDD_C | | | | |
| RSRQ ^{Note3} | Bands FDD_D Bands FDD_E, | dB | -17.77 | -17.77 | -17.77 |
| | FDD_F Note 6 | | | | |
| | Bands FDD_G | | | | |
| | Bands FDD_H | | | | |
| 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) |
|------------------------------|-----------------------|------------------------------|------------------------------|------------------------------|
| Bands FD | D B | -90.25+ | -86.75+ | -86.75+ |
| Ballus FD | ∪_В | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| Bands FD | D C | -89.75+ | -86.25+ | -86.25+ |
| Ballus FD | D_C | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| Bands FD | חח | -89.25+ | -85.75+ | -85.75+ |
| Ballus FD | 0_0 | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| Bands FD | D_E, | -88.75+ | -85.25+ | -85.25+ |
| FDD_F Not | e 6 | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| Bands FD | D G | -87.75+ | -84.25+ | -84.25+ |
| Ballus FD | D_G | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) | 10log(N _{RB,c} /50) |
| Bands FD | пн | -87.25+ | -83.75+ | -83.75+ |
| Ballds I B | U_II | 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 relativ | re to | | ≤TAE | ≤ TAE |
| cell 1 Note 7 | | - | ≥ IAE | ≥ IAE |
| Time alignment error relativ | re to | _ | _ | ≤ TAE |
| cell 2 Note / | | - | - | ≥ IAE |

- 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

| | ameter | Unit | Cell 1 | Cell2 | Cell3 |
|---|-----------------------------------|--------------------------------|--|--|--|
| E-UTRA RF Ch | annel 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 | | | 1 | |
| 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 | | | | | |
| PCFICH_RB | | | | | |
| PHICH_RA | | | | | |
| PHICH_RB | | dB | 0 | 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} | Bands TDD_A, TDD_C, TDD_E | dB | -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

| | | 1124 | Tes | st 1 | Tes | st 2 | Tes | st 3 |
|--|---------------------------------|---------------|-------------|-------------|-------------|-------------|----------------|----------------|
| | rameter | Unit | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| | hannel Number | MHz | , | | | | | |
| BW _{channel} | BW _{channel} | | 10 | | 10 | | 10 | |
| Measurement | bandwidth | $n_{\it PRB}$ | 22- | –27 | 22—27 | | 22—27 | |
| PDSCH Reference channel define | ence measurement d in A.3.1.1.3 | | R.13 FDD | - | R.13 FDD | - | R.13 FDD | - |
| PDSCH alloca | tion | $n_{\it PRB}$ | 13—36 | - | 13—36 | - | 13—36 | - |
| PDCCH/PCFIC | | | | | | | | |
| Reference meadefined in A.3. | asurement channel | | R.6 | FDD | R.6 | FDD | R.6 | FDD |
| OCNG Pattern | | | | | | | | |
| A.3.2.1.1 (OP. | 1 FDD) and | | OP.1 FDD | OP.2 FDD | OP.1 FDD | OP.2 FDD | OP.1 FDD | OP.2 FDD |
| A.3.2.1.2 (OP.: | 2 FDD) | | 100 | 100 | 100 | 100 | 100 | 100 |
| 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} | | | | | | | | |
| OCNG_RB ^{Note} | | | | | | | | |
| | Bands FDD_A Bands FDD_B | | -84.76 | | | | -1 | 16 5.5 |
| | Bands FDD_B Bands FDD_C | 1 | | | -103.85 | | -11 -1 | |
| Note2 | Bands FDD_D | | | | | | | 4.5 |
| $N_{oc}^{ m Note2}$ | Bands FDD_E, FDD F Note 5 | dBm/15 kHz | | | | | -1 | 14 |
| | Bands FDD_G | | | | | | -1 | 13 |
| | Bands FDD_H | | | | | | -112.5 | |
| \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 | | | | | | -119.5 | -119.5 |
| | Bands FDD_C | | | | | -106.75 | -119 -118.5 | -119 -118.5 |
| RSRP ^{Note3} | Bands FDD_D Bands FDD_E, | dBm/15 kHz | -81.76 | -81.76 | -106.75 | | | |
| | FDD_F Note 4 Bands FDD_G | | | | | | -118 | -118 |
| | Note 6 | | | | | | -117 | -117 |
| | Bands FDD_H | | | | | | -116.5 | -116.5 |
| | Bands FDD_A Bands FDD_B | | | | | | | |
| | Bands FDD_B Bands FDD_C | | | | | | | |
| | Bands FDD_D | | | | | | | |
| RSRQ ^{Note3} | Bands FDD_E, FDD_F Note 45 | dB | -14.77 | -14.77 | -16.76 | -16.76 | -17.34 | -17.34 |
| | Bands FDD_G | | | | | | | |
| | Bands FDD_H | | | | | | | |
| | Bands FDD_A | | | I | | 1 | -85 | .67 |
| | Bands FDD_B | | | | | | -85 | |
| Io ^{Note3} | Bands FDD_C | dBm/9 MHz | -5 | 50 | -73 | | | .67 |
| | Bands FDD_D | | | | | | | .17 |
| | Bands FDD_E, | | | | | | -83 | 5.67 |

| | 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 |
|---------------------------------|------------------------------|---------------|---------|--------|---------|------------|---------|--------|
| Pa | 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 | 10 | | 10 | | 10 | |
| Measurement | h an dwidth | | | –27 | | –27 | | –27 |
| | | $n_{\it PRB}$ | 22- | -21 | 22- | -21 | 22- | -21 |
| | ence measurement | | R.1 HD- | - | R.1 HD- | _ | R.1 HD- | - |
| channel define | d in A.3.1.1.4 | | FDD | | FDD | | FDD | |
| PDSCH alloca | tion | $n_{\it PRB}$ | 13—36 | - | 13—36 | - | 13—36 | - |
| PDCCH/PCFIC | CH/PHICH | | | | | | | |
| Reference mea | asurement channel | | R.3 HI | D-FDD | R.3 HI | D-FDD | R.3 HI | D-FDD |
| defined in A.3. | | | | | | | | 1 |
| 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 FDD) | | | | | | | |
| PBCH_RA | | | | | | | | |
| PBCH_RB | | | | | | | | |
| PSS_RA | | | | | | | | |
| SSS_RA PCFICH_RB | | | | | | | | |
| PHICH_RA | | | | | | | | |
| PHICH_RB | | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| PDCCH_RA | | ub | | | | | | |
| PDCCH_RB | | | | | | | | |
| PDSCH_RA | | | | | | | | |
| PDSCH_RB | | | | | | | | |
| OCNG_RA ^{Note} | 1 | | | | | | | |
| OCNG_RB ^{Note} | 1 | | | | | | | |
| _ | Bands FDD_A | | | | | | -1 | 16 |
| | Bands FDD_B | | | | | | -11 | 5.5 |
| | Bands FDD_C | | | | | | | 15 |
| λ/ Note2 | Bands FDD_D | | | | | | -11 | 4.5 |
| $N_{oc}^{ m Note2}$ | Bands FDD_E, | dBm/15 kHz | -84 | .76 | -103 | 3.85 | _1 | 14 |
| | FDD_F Note 4 | | | | | | ' | 17 |
| | Bands FDD_G | | | | | | -1 | 13 |
| | | | | | | | | 0.5 |
| A / | Bands FDD_H | | | | | | -11 | 2.5 |
| \hat{E}_s/N_{oc} | | dB | 3 | 3 | -2.9 | -2.9 | -4 | -4 |
| \hat{E}_{s}/I_{ot} | | dB | -1.76 | -1.76 | -4.7 | -4.7 | -5.46 | -5.46 |
| L _s /I _{ot} | | иь | -1.70 | -1.70 | -4.7 | -4.7 | | |
| | 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 |
| NONE | Bands FDD_E, FDD_F Note 4 | UDIII/ 13 KMZ | -01./0 | -81./6 | -100.75 | -100.75 | -118 | -118 |
| | Bands FDD_G | | | | | | | |
| | Note 6 | | | | | | -117 | -117 |
| | Bands FDD_H | | | | | | -116.5 | -116.5 |
| | Bands FDD_A | | | | | | | |
| | Bands FDD_B | | | | | | | |
| | Bands FDD_C | | | | | | | |
| | Bands FDD_D | | | | | | | |
| RSRQ ^{Note3} | Bands FDD E. | dB | -14.77 | -14.77 | -16.76 | -16.76 | -17.34 | -17.34 |
| | FDD_F Note 4 | | | | | | | |
| | Bands FDD_G | | | | | | | |
| | Note 6 | | | | | | | |
| | Bands FDD_H | | | | | | | |
| | Bands FDD_A | | | | | | | .67 |
| . Note3 | Bands FDD_B | | | | | | | .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 | | | | -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.9.2.43.3 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

| Danis and an | | l lmit | Test 1 | | Test 2 | | Test 3 | |
|--|-------------------------------------|--------------------------------|-------------|-------------|-------------|-------------|----------------------|----------------------|
| | rameter | Unit | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| E-UTRA RF Ch | nannel Number | | , | | , | | | 1 |
| BW _{channel} | | MHz | 1 | 0 | 1 | 0 | 1 | 0 |
| 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 | | -115 -114 | |
| \hat{E}_s/N_{oc} | ם במוועס דטט_ב | 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 | 1 | 0 | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) | | OP.1 | FDD | |

| 0 |
|-----|
| |
| |
| |
| |
| |
| |
| -98 |
| -94 |
| 4 |
| -94 |
| 4 |
| |
| _ |

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.9.3.1.2-3: 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 |
|------------|---------------------------------|----------|--------|-----------------|
| | | | 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 | | 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 TI |)D |
| (OP.1 TDD) | | 01.111 | ענ |

| 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 kHz | -98 |
| RSRP Note 4 | dBm/15 kHz | -94 |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 4 |
| SCH_RP Note 4 | dBm/15 kHz | -94 |
| \hat{E}_s/N_{oc} | dB | 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.9.3.2.2-3: 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 | | -50.00 | -90.5 (Note 3) |
| Band III, VIII, XII, XIII, XIV, | | | | -91.0 |
| | XX, XXII | | | |
| | Band IX (Note 2) | | | -93.0 |
| Pro | ppagation 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

| Par | ameter | Unit | Test 1 | Test 2 | |
|---|---|--------------------|--|---------|--|
| E-UTRAN RF | Channel Number | | | 1 | |
| BW _{channel} | | MHz | 5 | | |
| OCNG Patterns defined in | | | OP.15 FDD | | |
| A.3.2.1.15 (OP.15 FDD) | | dB | 01. | 13 1 00 | |
| | PBCH_RA | | | | |
| 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 | | | | |
| OCNG_RA ^{Note} | 1 | dB | | | |
| OCNG_RB ^{Note} | | 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 C | | | | WGN | |
| | | | e fully allocated and | | |
| 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 | | | | | |
| арр | appropriate power for N_{ac} to be fulfilled. | | | | |
| Note 3: RSI | RP, SCH_RP and I | o levels have beer | derived from other pole parameters thems | | |

A.9.3.3.3 Test Requirements

The test requirements defined in section A.9.3.1.3 shall apply to this test case.

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 | | DL Reference Measurement | As specified in clause A.3.1.2.1 |
| parameters | | Channel R.6 FDD | |
| E-UTRAN RF Channel | | 1 | One E-UTRAN FDD carrier frequency is |
| Number | | | used. |
| UTRAN RF Channel | | 1 | One UTRAN FDD carrier frequency is |
| Number | | | used. |
| E-UTRAN Channel | MHz | 10 | |
| Bandwidth (BW _{channel}) | | | |
| 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) | | CPICH Ec/N0 | |
| measurement quantity | | | |
| 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.9.4.1.2-2: 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 | 7 | | | |
| 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 | CCPCH_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, XIII, XIV, XX, XXII | MHz | | | -91.0 |
| | 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.9.4.1.3 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] | Conditions | |
|-----------|------|------------------|-------------------|-------------------|
| Parameter | Unit | Normal condition | Extreme condition | lo [dBm/3,84 MHz] |

| ODIOLI Falla | dB | -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 | dБ | ± 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 Note 1 | | | 1 | | | |
| OCNG Patterns defined in | | | OP.1 TDD | | | |
| A.3.2.2.1 (OP.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 | | | | |
| PDCCH_RA | dB | | | | | |
| PDCCH_RB | dB | | | | | |
| PDSCH_RA | dB | | | | | |
| PDSCH_RB | dB | | | | | |
| OCNG_RA ^{Note 2} | dB | | | | | |
| OCNG_RB ^{Note 2} | dB | | | | | |
| N _{oc} Note 3 | dBm/15 | | -98 | | | |
| RSRP Note 4 | kHz dBm/15 | | | | | |
| RSRP | kHz | | -94 | | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | dB | 4 | | | | |
| SCH_RP Note 4 | dBm/15 kHz | -94 | | | | |
| \hat{E}_s/N_{oc} | dB | 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 |
|------|---|------|--------|--------|-----------------|
| | Parameter | Unit | Cell 2 | Cell 2 | Cell 2 |
| | CPICH_Ec/lor | dB | -10 | -10 | -10 |
| P | CCPCH_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, XIII, XIV, XX, XXII | MHz | | | -91.0 |
| | 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] | Conditions | |
|-----------|------|------------------|-------------------|-------------------|
| Parameter | Unit | Normal condition | Extreme condition | lo [dBm/3,84 MHz] |
| | | | Condition | |

| CPICH_Ec/lo | dB | -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)) |
|-------------|----|---|-------|---|
| | | ± 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

| Parameter | | Unit | Test 1 | Test 2 | Test 3 | | |
|---|-----------------------------|-------------|--------|------------|--------|--|--|
| E-UTRAN RF Ch | annel Number | | 1 | | | | |
| BW _{channel} | | MHz | | 5 | | | |
| OCNG Patterns of | defined in | | | OP.15 FDD | | | |
| 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} | NG_RB ^{Note 1} | | | | | | |
| $N_{oc}^{ m Note~2}$ | Band 31 | dBm/15 kHz | | -98 | | | |
| RSRP Note 3 | Band 31 | dBm/15 kHz | | -94 | | | |
| $\hat{\mathbf{E}}_{\scriptscriptstyle \mathrm{s}}/\mathbf{I}_{\scriptscriptstyle \mathrm{ot}}$ | | dB | | 4 | | | |
| SCH_RP Note 3 | Band 31 | dBm/15 kHz | | -94 | | | |
| \hat{E}_s/N_{oc} | $\frac{\hat{E}_s/N_{oc}}{}$ | | 4 | | | | |
| Io ^{Note3} | Band 31 | dBm/4.5 MHz | -67.8 | | | | |
| Propagation Cond | 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.

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 | | DL Reference Measurement | As specified in clause A.3.1.2.1 |
| parameters | | Channel R.6 FDD | |
| 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 | ١ |
| FDD) | | ` | JF.1 FDL | |
| 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 N 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 | Test 1 | | Test 2 | | Test 3 | |
|------------------------------|-------------|--------|-------|--------|-------|--------|-------|
| DL timeslot number | | 0 | | DwPTS | | 0 | DwPTS |
| UTRA RF Channel number Note2 | | Char | 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 | 4.1 | -75 | 5.2 | -6 | 97 |
| Îor/loc | dB | 2 | 2 | | 5 | (|) |
| PCCPCH RSCP Note1 | dBm | -55.1 | | -73.2 | | -100 | |
| lo Note1 | dBm/1.28MHz | -5 | 50 | -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 | | | OP.1 TDD | 1 | |
| TDD) | | ` | | <u>'</u> | |
| PBCH_RA | | | | | |
| PBCH_RB | | | | | |
| PSS_RA | | | | | |
| SSS_RA | | | | | |
| PCFICH_RB | | | | | |
| PHICH_RA | | dB 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 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 | Test 1 | | Tes | Test 2 | | Test 3 | |
|------------------------------|-------------|--------|-------|-------|--------|------|--------|--|
| DL timeslot number | | 0 | | DwPTS | | 0 | DwPTS | |
| UTRA RF Channel number Note2 | | Char | nel 2 | Char | 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 | 4.1 | -7 | 5.2 | -6 | 97 | |
| Îor/loc | dB | 2 | 2 | | 5 | (|) | |
| PCCPCH RSCP Note1 | dBm | -55.1 | | -73.2 | | -100 | | |
| lo Note1 | dBm/1.28MHz | -5 | 50 | -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.9.5.2.3 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} | 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 | 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 |
| $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$ | 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 (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 | |
| DRX | - | OFF | |
| 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 |
| 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 quantity | | GSM Carrier RSSI | |
| Monitored cell list size | | 6 GSM neighbours including ARFCN 1 | Included in the Measurement 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 |
| | OF.1 1DD |
| dB | |
| dB | 0 |
| dB | 1 |
| dB | 1 |
| dB | 1 |
| dB | |
| dB | 1 |
| dB | 1 |
| 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 | | Ol | FF |
| PDSCH Reference measurement channel defined in A.3.1.1.1 | | R.2 FDD | R.0 FDD |
| PDSCH allocation | n_{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 |
| To 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 | | | '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 modeled 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.

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 | Commont | | | |
|--|--------|--------|--------------------------------|--|--|--|
| Field | Value | | Comment | | | |
| srsBandwidthConfiguration | bw7 | bw5 | | | | |
| srsSubframeConfiguration | S | c1 | | | | |
| ackNackSrsSimultaneousTransmission | FA | LSE | | | | |
| srsMaxUpPTS | N | I/A | Not applicable for FDD | | | |
| srsBandwidth | | 0 | No hopping | | | |
| srsHoppingBandwidth | hbw0 | | | | | |
| frequencyDomainPosition | 0 | | | | | |
| Duration | TF | RUE | Indefinite duration | | | |
| Srs-ConfigurationIndex | 0 | | SRS periodicity of 2ms 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 clause 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}/N | 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 | | 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 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

| Field | Test 1 | Test 2 | Comment | | | |
|--|--------|--------|---------------------------------|--|--|--|
| Field | Value | | Comment | | | |
| srsBandwidthConfiguration | bw7 | bw5 | | | | |
| srsSubframeConfiguration | S | c1 | | | | |
| ackNackSrsSimultaneousTransmission | FA | LSE | | | | |
| srsMaxUpPTS | TF | RUE | | | | |
| 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 clause 6.3.2 in TS 36.331. | | | | | | |

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 | | | |
| PCFICH_RB | dB | | Non-ABS and | |
| PHICH_RA | dB | | ABS subframe channel powers defined in Table | |
| PHICH_RB | dB | 0 | | |
| PDCCH_RA | dB | | | |
| PDCCH_RB | dB | | A.3.4.1.1-1. | |
| PDSCH_RA | dB | | | |
| PDSCH_RB | dB | | | |
| OCNG_RA ^{Note1} | dB | | | |
| OCNG_RB ^{Note1} | dB | | | |
| $N_{oc}^{ m Note 2}$ | dBm/15 kHz | -98 | -98 | |
| ${ m CRS}\hat{E}_s/N_{oc}$ | 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 | |
| (Io) _{meas} Note 4 | dBm/9 MHz | -67.89 | -67.89 | |
| (Io) _{nonABS} Note 4 | dBm/9 MHz | -65.81 | -65.81 | |
| Propagation condition | | AV | VGN | |

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. ${\rm (Io)}_{\it meas}$ is calculated in CRS symbols in the subframes indicated for PCell measurements by measurement resource restriction pattern, whilst ${\rm (Io)}_{\it nonABS}$ 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 clause 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 OB.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 POSCH_RB -98 POSC | 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

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 | 12000 |
| 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. | for SKS transmission |

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

| Parameter | | Unit | Value | Comment | |
|----------------------------------|-------------------------|------|--|--|--|
| Serving cell (PC | Serving cell (PCell) | | Cell 1 | The measured cell | |
| Neighbour cell | Neighbour cell | | Cell 2 and Cell 3 | Cell 2 is the first interfering cell to Cell 1, whilst | |
| | Neigribour ceil | | | 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 | AL ARDOEN AROUND AROUN A CUE | |
| | | | 10000000100000001000 | Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. | |
| | | | 000010000001000000000000000000000000000 | 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 | Time-domain measurement | | '100000010000001000 | and the state of t | |
| resource restriction pattern for | | | 00001000000010000000 | Configured for measurements on Cell 1. | |
| PCell measurements | | | | | |
| | physCellId | | see PCI conditions above | The CDC againstones information is provided for | |
| CBS | CRS antennaPortsC | | 1 | The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It | |
| assistance ount | | | <u> </u> | includes a single MBSFN-SubframeConfig | |
| information | mbsfn- | | | element with subframe allocation one | |
| IIIIOIIIIalioii | SubframeConfi | | oneFrame = '000000' | Frame='000000'. | |
| | gList | | | 1 Tame= 000000 . | |

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 ARS

| 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 ABS subframe channel powers defined in Tab A.3.4.1.1-1. | | |
| PHICH_RB | dB | 0 | | | |
| PDCCH_RA | dB | | | | |
| PDCCH_RB | dB | | | | |
| PDSCH_RA | dB | | | | |
| PDSCH_RB | dB | | | | |
| OCNG_RA ^{Note1} | dB | | | | |
| OCNG_RB ^{Note1} | dB | | | | |
| $N_{oc}^{ m Note 2}$ | dBm/15 kHz | -98 | -98 | -98 | |
| ${ m CRS}\hat{E}_s/N_{oc}$ | 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 | |
| (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 clause 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 | n | 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 | MHz | 10 | For all cells in the test |
| (BW _{channel}) | | | |
| CP length | | Normal | For all cells in the test |
| Special subframe configuration | 1 | 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 | | '0000000010000000001' | Configured for measurements on Cell 1. |
| CRS assistance physCellId antennaPort ount | sC | see PCI conditions above | The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig |
| information mbsfn- SubframeCo gList | nfi | 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 | IN/A | 11/74 | |
| 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 | | 11.0 100 | IN/A | 111/74 | |
| 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) | | 0111100 | 01.2.100 | 01 12 122 | |
| 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 | channel powers defined in Ta A.3.4.1.1-1. | | |
| PDCCH_RA | dB | | | | |
| PDCCH_RB | dB | | | | |
| PDSCH_RA | dB | | | | |
| PDSCH_RB | dB | | | | |
| OCNG_RA ^{Note1} | dB | | | | |
| OCNG_RB ^{Note1} | dB | | | | |
| $N_{oc}^{$ | dBm/15 kHz | -98 | -98 | -98 | |
| 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 | |
| ${ m (Io)}_{meas}^{ m Note~4}$ | 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 | | |

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 | 10000 |
| 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.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 | | Va | | Comment | |
|---|------|--|---|--|---|---|
| | | Test1 | Test2 | Test3 | Test4 | |
| PCFICH/PDCCH/PHICH parameters | | R.8 | R.8 FDD | | 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 Bandw OTDO data de | | | PRS bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24]. | |
| PRS configuration Index I_{PRS} | | 1 | 2 | 2 | 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 | | | Nor | | | |
| DRX | | | 0 | | | |
| 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 | | | PRS are transmitted from synchronous cells |
| Number of cells provided in OTDOA assistance data | | | 1 | The number of cells includes the reference cell | | |
| T _{RSTD} IntraFreqFDD, E-UTRAN | ms | | 25 | 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 | Te | st1 | Test2 | | Te | Test3 | | Test4 | |
|--|-----------------|---------|---------|--------|--------|---------|---------|-------|-------|--|
| Farailleter | Unit | 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 $\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$ | 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 | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 3}}$ | 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 | | | | | | | | | | |

y 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.

 \hat{E}_s/N_{ac} , PRS \hat{E}_s/I_{ct} , Io, RSRP and PRP levels have been derived from other parameters for information Note 3: 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 Δ T 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 | Comment | | |
|---|------|--|---|---|--|---|
| | | Test1 | Test2 | Test3 | Test4 | |
| PCFICH/PDCCH/PHICH parameters | | R.8 | R.8 TDD | | 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). |
| Neighbour cell | | Cell 1 Cell 2 | | | | |
| E-UTRA RF Channel Number | | OCII Z | | 1 | | One TDD carrier frequency is used. |
| Channel Bandwidth (BW _{channel}) | MHz | 1 | .4 | 1 | 0 | noquoney io uocu. |
| PRS Bandwidth | RB | (| 6 | 5 | 0 | 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_{PRS} | | (| 9 | 1 | 4 | As defined in TS 36.211 |
| Number of consecutive positioning downlink subframes N_{PRS} | | (| 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 | | 055 | Noi | mal | | |
| DRX | | OFF | | | | DD0 / 100 / |
| 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 | | | 1 | 6 | | 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 |
|--|----|------|--|
|--|----|------|--|

Table A.9.8.2.1-2: Cell Specific Test Parameters for intra frequency RSTD Tests for E-UTRAN TDD

| Parameter | Unit | Test1 | | Test2 | | Test3 | | Test4 | |
|---|-----------------|---------|---------|--------|--------|---------|---------|-------|-------|
| | Offic | 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 |
| ${ m \hat{E}}_{ m s}/N_{oc}^{ m Note~3}$ | 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_{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 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:'11110000' Cell2:'11110000' | | See clause 6.5.1.2 in TS 36.355 for more information | | | |
| expectedRSTD | μs | Cell 2:1 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 transmit time offset between the cells at the UE antenna connector | μs | 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]. | | | |
| $T_{ m RSTD\ InterFreqFDD,E-UTRAN}$ | 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

| Parameter | Unit | 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 $\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$ | 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.9.8.3.2 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 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 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 | | 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:'11110000' Cell2:'11110000' | | PRS muting is not used. See clause 6.5.1.2 in TS 36.355 for more information | | | | |
| expectedRSTD μs | | Cell 2: 1 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 | 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 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 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]. | | | | |
| $T_{RSTD\ InterFreqTDD,\ E-UTRAN}$ | ms | 5120 | | Derived according to the RSTD measurement 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

| Parameter | l lmit | 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 | | | | | |
| 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 $\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$ | 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 | | | 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} , 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 $N_{\rm PRS}$ | | 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 $\hat{E}_{_{s}}/I_{_{ot}}$ | 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, Io 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.9.8.5.2 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 $\hat{E}_{_{s}}/I_{_{ot}}$ | 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}_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_{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 othe | er general test parameters. | • |

Table A.9.8.7.1-2: Cell Specific Test Parameters for RSTD Tests for E-UTRAN FDD for Carrier Aggregation for 20MHz bandwidth

| Parameter | | 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. | See Table A.9.8.5.1-2 for other cell specific test parameters. | | | | | | |

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

| ı | Parameter | Unit | Cell1 | Cell2 | Cell3 | | |
|--------------------|--------------------|--|--------|--------|--------|--|--|
| lo Note1 | | dBm/18 MHz | -67.03 | -67.00 | -67.00 | | |
| Note 1: Note 2: | values are derived | has been derived from other parameters for information purposes. It is not settable parameter itself. Io are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS ble A.9.8.6.1-2 for other cell specific test parameters. | | | | | |

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 | Note 1: See Table A.9.8.5.1-1 for other general test parameters. | | | | | |

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 | | | |
|--|---------------------------------|---------------------|----------------|--------|--|--|--|
| Io Note1 dBm/9 MHz | | -70.04 | N/A | N/A | | | |
| 10 | dBm/4.5 MHz | | -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 | 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 | | Cell1: R.6 TDD | As specified in clause A.3.1.2.2 |
| parameters | | Cell2: R.11 TDD Cell3: R.11 TDD | |
| 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 | 6.1-1 for c | other general test parar | meters. |

Note 2: N/A

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 | | |
|---|-------------|--------|--------|--------|--|--|
| lo 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: Se | · · · · · · | | | | | |

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 g Note 2: N/A | eneral 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 | Io 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 | | | | not settable | |
| parameter itself. Io values are derived in the case that there is no PBCH, PSS or SSS in the | | | | | 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 | eral test | 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 |
|----------------------|--|--------|--------|--------|
| Io Note1 dBm/4.5 MHz | | -73.05 | -73.02 | -73.02 |
| | | | 1. 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 See Table A.9.8.6.1-2 for other cell specific test parameters. Note 2:

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 | | Cell1: R.10 TDD | As specified in clause A.3.1.2.2 |
| parameters | | Cell2: R.6 TDD | |
| | | Cell3: R.6 TDD | |
| 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 | | Cell1: 20 | |
| (BW _{channel}) | MHz | Cell2: 10 | |
| | | Cell3: 10 | |
| PRS Bandwidth | | Cell1: 100 | PRS Bandwidth bandwidth is as |
| | RB | Cell2: 50 | indicated in <i>prs-Bandwidth</i> in the OTDOA |
| | | Cell3: 50 | assistance data defined in [24]. |
| Note 1: See Table A.9.8.6 Note 2: N/A | 6.1-1 for | other general test para | ameters. |

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 | arameter Unit Cell1 | | Cell1 | Cell2 | Cell3 |
|---|---------------------|---------------------------|-----------------------|-------------|--------|
| lo Note1 | | dBm/ 18MHz | -67.03 | N/A | N/A |
| 10 | | dBm/ 9MHz | N/A | -70.01 | -70.01 |
| 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.9.8.6.1-2 for oth | er 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 $I_{\rm PRS}-160$ 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: | 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 | |
| Radio frame receive time offset between the cells at the UE antenna connector | μs | 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 | μѕ | ≤ 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 _{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 | R.10 FDD | R.10 FDD |
| | | 5MHz: | 5MHz: | 5MHz: | 5MHz: |
| | | OP.18 FDD 10MHz: | OP.18 FDD 10MHz: | OP.18 FDD 10MHz: | OP.18 FDD 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 | | | | | |
| transmission bandwidth depends on selected | | 5MHz: 25 | 5MHz: 25 | 5MHz: 25 | 5MHz: 25 |
| channel bandwidth. PRS are transmitted over | RB | 10MHz: 50 | 10MHz: 50 | 10MHz: 50 | 10MHz: 50 |
| the system bandwidth) | | 20MHz:100 | 20MHz:100 | 20MHz:100 | 20MHz: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 | | | | | |
| PDCCH_RA | | | | | |
| PDCCH_RB | | | | | |
| OCNG_RA ^{Note1} | | | | | |
| OCNG_RB ^{Note1} | | | | | |
| PRS_RA | dB | -3 | 0 | 0 | 0 |
| $N_{oc}^{ m Note2}$ | dBm/15 kHz | | -6 | 98 | |
| PRS \hat{E}_s/N_{oc} | dB | -6 | -6 | -6 | -13 |
| | иь | -0 | -6 | -0 | -13 |
| PRS $\hat{E}_{_{\mathrm{s}}}/I_{_{\mathrm{ot}}}$ | dB | -6 | -6 | -6 | -13 |
| | dBm/9 | -70.04 | -70.01 | -70.01 | -70.01 |
| lo Note3 | MHz | +10log | +10log | +10log | +10log |
| | | (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: | 5MHz: | 5MHz: | 5MHz: |
| OCNG Patterns defined in A.3.2.2 (| | OP.10 TDD | OP.10 TDD | OP.10 TDD | OP.10 TDD |
| There is no PDSCH allocated in the subframe | | 10MHz: | 10MHz: | 10MHz: | 10MHz: |
| transmitting PRS) | | OP.2 TDD | OP.2 TDD | OP.2 TDD | OP.2 TDD |
| , | | 20MHz: OP.8 TDD | 20MHz: | 20MHz: OP.8 TDD | 20MHz: OP.8 TDD |
| PRS Transmission Bandwidth (PRS | | UP.6 100 | OP.8 TDD | UP.6 1DD | UP.6 1DD |
| transmission bandwidth depends on selected | | 5MHz: 25 | 5MHz: 25 | 5MHz: 25 | 5MHz: 25 |
| channel bandwidth. PRS are transmitted over | RB | 10MHz: 50 | 10MHz: 50 | 10MHz: 50 | 10MHz: 50 |
| the system bandwidth) | | 20MHz:100 | 20MHz:100 | 20MHz:100 | 20MHz: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 | 1 | | | | |
| SSS_RA | 1 | | | | |
| PCFICH_RB | 1 | | | | |
| PHICH_RA | dB | 0 | 0 | 0 | 0 |
| PHICH_RB | 1 "2 | Ü | | · · | |
| PDCCH_RA | 1 | | | | |
| PDCCH_RB | | | | | |
| OCNG_RA ^{Note1} | | | | | |
| OCNG RB ^{Note1} | | | | | |
| PRS_RA | dB | -3 | 0 | 0 | 0 |
| | dBm/15 | | _ | _ | - |
| $N_{oc}^{ m Note2}$ | kHz | | -9 | 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 |
| | dD/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 | 1 | | AW | 'GN | 1 |
| Note 1: OCNG shall be used such that both s | alla ana fullu all | | | | |

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

| Pa | rameter | Unit | Test Cell 1 | | |
|--|------------------------------|------------------------------|----------------|--|--|
| E-UTRA RF Ch | annel Number | | 1 | | |
| BW _{channel} | | MHz | 10 | | |
| Measurement b | andwidth | $n_{\scriptscriptstyle PRB}$ | 22—27 | | |
| PDSCH Reference measurement channel defined in A.3.1.1.1 | | | R.0 FDD | | |
| PDSCH allocati | | n_{PRB} | 13—36 | | |
| | H/PHICH Reference | PRB | 10 00 | | |
| A.3.1.2.1 | channel defined in | | R.6 FDD | | |
| OCNG Patterns (OP.1 FDD) | 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 | | | - | | |
| PDCCH_RB | | | | | |
| PDSCH_RA | | | | | |
| PDSCH_RB OCNG_RA ^{Note1} | | | | | |
| OCNG_RA OCNG RB ^{Note1} | | | | | |
| OCNG_KB | Bands FDD_A | | -122 | | |
| | Bands FDD_B | | -121.5 | | |
| | Bands FDD_C | | -121 | | |
| $N_{oc}^{ m Note2}$ | Bands FDD_D | dBm/15 kHz | -120.5 | | |
| | Bands FDD_E, FDD_F Note 5 | dbill/15 ki iz | -120 | | |
| | Bands FDD_G Note 7 | | -119 | | |
| | Bands FDD_H | | -118.5 | | |
| $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$ | | dB | -4 | | |
| s / ot | Bands FDD A | | -126 | | |
| | Bands FDD_B | | -125.5 | | |
| | Bands FDD_C | | -125 | | |
| | Bands FDD_D | | -124.5 | | |
| RSRP ^{Note3} | Bands EDD E | dBm/15 kHz | -124 | | |
| KOKF | FDD_F Note 5 | UDIII/13 KI12 | -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 | | |
| NONQ | 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 | | |
| | 1 · | 1 | | | |

| | 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 that and a constant total transmachieved for all OFDM symulterference from other cellithe test is assumed to be countried and shall be modelled as All | itted power spect bols. s and noise soul onstant over sub | ctral density is rces not specified in ocarriers and time |
| | N_{oc} to be fulfilled. | | |
| Note 3: | RSRP, RSRQ and lo levels parameters for information parameters themselves. | | |
| Note 4: | RSRP minimum requirement independent interference as port. | • | • |
| Note 5: | For Band 26, the tests shall frequency of the assigned E 865-894 MHz. | • | |
| Note 6: Note 7: | E-UTRA operating band gro Except Band 29 and Band 3 | • | 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

| Р | arameter | Unit | Test Cell 1 | |
|--|---------------------------|------------|----------------|--|
| E LITDA DE C | hannel Number | | 1 | |
| BW _{channel} | Harmer Number | MHz | 10 | |
| Special subfra | me configuration Note1 | IVII IZ | 6 | |
| Uplink/downlin | nk configuration Note1 | | 1 | |
| Measurement | | n_{PRB} | 22—27 | |
| PDSCH Refer | ence measurement | T KD | R.0 TDD | |
| PDSCH alloca | | n_{PRB} | 13—36 | |
| PDCCH/PCFI | CH/PHICH Reference | FKB | | |
| | channel defined in | | R.6 TDD | |
| OCNG Patterr (OP.1 TDD) | ns 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 OCNG_RB Note Noce | Bands TDD_A Bands TDD_C | dB dB | -122 -121 | |
| ^ /- | Bands TDD_E | | -120 | |
| ${ m \hat{E}}_{_{ m s}}/{ m I}_{_{ m ot}}$ | | dB | -4 | |
| | Bands TDD_A | | -126 | |
| RSRP ^{Note4} | Bands TDD_C | dBm/15 kHz | -125 | |
| | Bands TDD_E | | -124 | |
| | Bands TDD_A | | | |
| RSRQ ^{Note4} | Bands TDD C | dB | -16.25 | |
| | Bands TDD_E | | | |
| | Bands TDD_A | | -92.76 | |
| Io ^{Note4} Bands TDD_C | | dBm/9 MHz | -91.76 | |
| | Bands TDD_E | † | -90.76 | |
| \hat{E}_s/N_{oc} | . = | dB | -4 | |
| Propagation condition - AWGN | | | | |
| Note 1: For | special subframe and | | | |
| | oles 4.2-1 and 4.2-2 in 1 | | | |
| Note 2: OCNG shall be used such that both cells are fully allocated | | | | |

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

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

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 | | Value | Comment |
|------------------|--|------------|---|---|
| E-UTRA RF Char | E-UTRA RF Channel Number | | 1 | |
| Channel Bandwic | Channel Bandwidth (BW _{channel}) | | 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 | | |
|--|-------|--|---|----|--|
| Parameter | Offic | T1 | T2 | T3 | |
| 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 Configuration | | |
| | | #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: Tevaluate 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 | Active synchronization | | 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 o | r 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 | Active synchronization source | | Sync Ref UE 1 | |
| Final condition | Active synchronization source | | Cell1 | |
| E-UTRA RF Cha | annel Number | | 1 | |
| Channel Bandwi | idth (BW _{channel}) | MHz | 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 Co | mmunication preconfiguration | | As specified in Table A.3.12.5-2 (Configuration #2) | IE values unless specified otherwise in this test. |
| syncTxThreshO | оС | | 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 | | |
|---|------------|--------------------------------------|------|--|
| Parameter | Onit | T1 | T2 | |
| E-UTRA RF Channel Number | | 1 | | |
| BW _{channel} Note 4 | MHz | 5 oı | · 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 | | 0 | | |
| PHICH_RB | dB | | | |
| PDCCH_RA | | | | |
| PDCCH_RB | | | | |
| PDSCH_RA | | | | |
| PDSCH_RB | | | | |
| OCNG_RA ^{Note 1} | | | | |
| OCNG_RB ^{Note 1} | | | | |
| $N_{oc}^{$ | dBm/15 kHz | -9 | 8 | |
| \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 SyncRef UE 1 | | 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 | I |
| slssid | | 30 | |
| inCoverage (in MIB-SL) | | TRU | IE . |
| 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 |
|------------|---|------------------------|--------------------------|-------------|------------|
| | | dBm/15kHz | dBm/15kHz | dB | dB |
| | FDD_A, TDD_A | -124 | -124 | | |
| Conditions | FDD_B | -123.5 | -123.5 | ļ | |
| | FDD_C, TDD_C | -123 | -123 | | |
| | FDD_D | -122.5 | -122.5 | | |
| | 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.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 $\hat{E}s/Iot$ 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.

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 | ≥ -4 | ≥ -4 |
| | 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 | | |
| | 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.

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 -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.2.4 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 | 1 |

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 -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.2.5 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

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 $\Delta > 0$, 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.2.6 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 Δ >0, when applicable, as described in Sections B.4.2 and B.4.3.

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 $\hat{E}s/Iot$ 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 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.

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.

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 | 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 | ≥ -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.

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.

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.2.12-1: 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 |
| | is condition level is increased by Δ >0, when applicable, as described ir UTRA operating band groups are as defined in Section 3.5. | Sections B.4.2. |

B.2.12 Conditions for E-UTRAN inter-frequency discovery signal measurements under operation with frame structure 3

B.2.12.1 Conditions for E-UTRAN inter-frequency CRS-based measurements

This section 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 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.2.12.1-1.

Table B.2.12.1-1: 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 ∆>0, when applicable, as described in Sections B.4.2 and B.4.3. | | | | | |
| NOTE 2: E- | UTRA operating band groups are as | s defined in Section | 3.5. | | |

B.2.12.2 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.2.12.2-1.

Table B.2.12.2-1: E-UTRAN inter-frequency discovery signal measurements

| Parameter | E-UTRA operating band groups Note 2 | Minimum CSI- RSRP Note 1 | Minimum SCH_RP Note 1 | CSI-RS Ês/lot | SCH Ês/lot |
|--|---|-----------------------------|--------------------------|------------------|---------------|
| | groups | dBm/15kHz | dBm/15kHz | dB | dB |
| Conditions | FS3_G | -122 | -122 | ≥ 0 | ≥ -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-I | NOTE 2: 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.

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.3.6 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.

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 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.3.9 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.

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.

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.

NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.

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.

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.3.23 Conditions for Intra-Frequency Absolute Accuracy Requirements for Measurements under Operation with Frame Structure 3

B.3.23.1 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.3.23.1-1.

Table B.3.23.1-1: 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.3.23.2 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.3.23.1-1.

B.3.23.3 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.3.23.3-1.

Table B.3.23.3-1: 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: 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: 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.3.22.2 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: 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.3.23 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.3.23.1-1.

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.3.23.1-1.

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.3.23.3-1.

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 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 in Any Cell Selection State State

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 |
| | 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/Seselection 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

Annex C (informative): Change history:

| | | | | | Change History | | |
|--------------------|----------------|------------------------|------------|-----|---|----------------|----------------|
| Date | TSG# | TSG Doc. | CR | Rev | Subject | Old | New |
| 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 | 8.0.0 | 8.1.0 |
| 2008-05 | RP#40 | RP-080325 | 3 | | Updates of TS36.133 | 8.1.0 | 8.2.0 |
| 2008-09 | RP#41 | RP-080644 | 006 | 1 | E-UTRAN TDD intra frequency measurements when DRX is used | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080644 | 800 | 1 | E-UTRAN TDD - UTRAN TDD measurements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080644 | 012 | | RSRQ reporting Range | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080644 | 018 | 1 | Interfrequency and UTRA interRAT DRX peformance requirements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080644 | 020 | 1 | Additions to UE transmit timing requirements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080644 | 043 | | Received interference power measurement performance requirement | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080644 | 044 | | Cell Synchronization requirement for E-UTRA TDD | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080644 | 047 | | Power Headroom Requirements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080644 | 048 | | Event Triggering and Reporting Criteria Capability Requirements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080642 | 004 | | Correction of E-UTRAN to UTRAN TDD handover | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080642 | 016 | 1 | Definition of Symbols | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080642 | 019 | 1 | Idle mode requirements updates | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080642 | 021 | 1 | General updates to 36.133 | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080642 | 023 | 1 | Handover requirements for E-UTRAN to cdma200 HRPD/1x | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080642 | 024 | | Inter-frequency and inter-RAT measurement requirements for multiple layer monitoring | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080642 | 025 | | Side conditions for UE measurement procedures and measurement performance requirements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080642 | 026 | | Correction to cell reselection Requirement from E-UTRAN to HRPD/cdma200 1x | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080642 | 027 | | IRAT Measurement requirements in TS 36.133 | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080713 | 022 | 1 | Corrections to Handover requirements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080713 | 028 | | Measurement reporting requirements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080713 | 029 | 2 | RRC re-establishment requirements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080713 | 032 | | Correction to UE measurement requirements | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080713 | 033 | 4 | Correction for the definition of interruption time | 8.2.0 | 8.3.0 |
| 2008-09 | RP#41 | RP-080713 | 040 | 1 | Correction to idle mode higher priority search requirements | 8.2.0 | 8.3.0 |
| 2008-09 2008-09 | RP#41 RP#41 | RP-080713 RP-080713 | 045 046 | | E-UTRAN TDD inter frequency measurement requirements Updates of the Measurement procedures in RRC_Connected | 8.2.0 8.2.0 | 8.3.0 8.3.0 |
| | | | | | state from RAN 4#47bis and RAN 4#48 | | |
| 2008-12 | RP#42 | RP-080919 | 53 | | Introduction of 700MHz Bands 12, 14 and 17 | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080928 | 88 | 1 | CR to 36.133 on Radio Link Failure Monitoring | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080929 | 51 | | Correction to idle mode requirements | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080929 | 52 | | Definition of out of service area | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080929 | 54 | | Measurement requirements for UTRAN TDD cells in idle state | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080929 | 69 | 2 | Correction of Inter-RAT UTRA cell reselection requirement | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080929 | 55 | | Correction of E_UTRAN cell measurement requirements in idle state | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080930 | 76 | | Correction to HO Requirements | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080931 | 71 | | Random access requirements | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080932 | 85 | | Cell phase synchronization error for large cell | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080932 | 63 | 4 | Synchronization Requirements for E-UTRAN to 1xRTT and HRPD Handovers | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080933 | 49 | | E-UTRAN TDD-TDD intra/inter frequency measurement reporting requirements | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080933 | 50 | | E-UTRAN FDD – UTRAN FDD Measurement reporting requirements | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080933 | 58 | | Measurement requirement for E-UTRAN TDD to UTRAN TDD/FDD when DRX is used | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080933 | 60 | | Interfrequency and GSM measurement performance requirements in large DRX | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080933 | 62 | 1 | Correction of implementation margin for transmission gap. | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080933 | 72 | | Alignement of DRX cycle dependent requirements | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080933 | 73 | 1 | Alignement of side conditions for mobility measurements | 8.3.0 | 8.4.0 |

| 2008-12 | RP#42 | RP-080933 | 66 | T 1 | Manager models in PRC CONNECTED | 8.3.0 | 0.40 |
|---------|---------|------------|----------|----------|--|-------|----------------|
| 2008-12 | RP#42 | RP-080933 | 66 78 | 1 | Measurement models in RRC_CONNECTED Limitation of maximum number of layers for multiple | 8.3.0 | 8.4.0 8.4.0 |
| 2000-12 | 131 #42 | 111-000933 | '0 | ' | monitoring | 0.3.0 | 0.4.0 |
| 2008-12 | RP#42 | RP-080933 | 83 | 1 | GSM Cell identification requirements for parallel monitoring | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080933 | 87 | 1 | UE transmit timing requirement | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080933 | 56 | | Correction of TS 36.133 clause 8.1.2.1.1. | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080934 | 77 | | Correction to RSRQ Report Mapping | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | KF-000934 | 86 | 1 | Missing side conditions for RSRP and RSRQ | 8.3.0 | 8.4.0 |
| | | DD | | <u> </u> | · · | | |
| 2008-12 | RP#42 | RP-080935 | 81 | 1 | Phase I RRM Test Cases | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | | 80 | 1 | Test Configuration for RRM Tests: Measurement Reference Channels and OCNG | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080936 | 75 | | Cdma200 1xRTT Measurement Requirements | 8.3.0 | 8.4.0 |
| 2008-12 | RP#42 | RP-080937 | 74 | 1 | E-UTRA to UTRA cell search requirements for SON | 8.3.0 | 8.4.0 |
| 2009-03 | RP#43 | RP-090182 | 101 | 1 | Correction of A3-offset parameter in RRM test case | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090182 | 105 | | Some Editorial Corrections | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090182 | 145 | | Clarifications for the DRX state | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090183 | 89 | | Modification on measurements of UTRAN TDD cells | 8.4.0 | 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 | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090183 | 98 | | Clarification of 'Out of Service Area' Concept and Definition | 8.4.0 | 8.5.0 |
| | _ | | | | | | |
| 2009-03 | RP#43 | RP-090183 | 118 | | Radio link monitoring | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090183 | 142 | 1 | Update of RRC_IDLE state mobility side conditions | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090183 | 150 | | UE measurement capability in Idle mode | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090184 | 133 | | Removal of RRC re-establishment procedure delay | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090184 | 138 | 1 | Correction for the UE Re-establishment delay requirement | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090185 | 92 | 2 | Cell phase synchronization accuracy | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090185 | 97 | | Radio link monitoring in DRX | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090185 | 120 | | UE Transmit Timing | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090185 | 137 | 1 | Clarification of the reference point for the UE initial transmission timing control requirement | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 90 | | Correction of clause 8.1.2.2.2.2 in TS36.133 | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 93 | 1 | cdma2000 1xRTT and HRPD Measurement Requirements | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 94 | | Event Triggered Periodic Reporting Requirements for IRAT Measurements | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 95 | | Measurement Reporting Requirements for E-UTRAN TDD – UTRAN TDD Measurements | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 99 | 1 | Clarification of UE behavior when measurement gap is used | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 100 | | E-UTRA to UTRA cell search requirements in DRX for SON | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 110 | 1 | Correction to GSM BSIC Requirements for Parallel Monitoring | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 117 | | Alignment of terminology for GAP | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 134 | | Inter frequency and Inter RAT cell search requirement when DRX is used | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 139 | | Correction of E-UTRAN FDD – UTRAN FDD measurements when no DRX | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 146 | | Addition of the definition of "when DRX is used" | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090186 | 147 | 1 | Corrections to E-UTRAN inter-frequency side conditions | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090187 | 96 | | Correction to Intra-frequency RSRP Accuracy Requirements | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090187 | 136 | 1 | Power Headroom reporting delay | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 103 | 1 | E-UTRAN -GSM Handover Test Case | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 104 | 1 | E-UTRAN FDD - UTRAN TDD Cell Search Test Cases in Fading | 8.4.0 | 8.5.0 |
| | RP#43 | RP-090370 | 106 | 1 | E-UTRA FDD to UTRA FDD Handover Test Case | 8.4.0 | 8.5.0 |

| 2009-03 | RP#43 | RP-090370 | 107 | 1 | Correction of E-UTRA FDD-FDD Intra-frequency cell reselection test case | 8.4.0 | 8.5.0 |
|---------|-------|-----------|-----|---|--|-------|-------|
| 2009-03 | RP#43 | RP-090370 | 108 | 1 | Correction of E-UTRA FDD-FDD priority based Inter- | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 111 | | frequency cell reselection test case E-UTRAN TDD - UTRAN FDD Handover Test Case | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 112 | 1 | E-UTRAN FDD - GSM Cell Search Test Case in AWGN | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 113 | ' | E-UTRAN - UTRAN FDD Cell Search Test Cases in Fading | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 114 | 1 | E-UTRAN UE Timing Accuracy Related Test Cases | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 115 | 1 | Inclusion of MBSFN Configurations for RRM Test Cases | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 116 | | E-UTRAN FDD HRPD Cell Reselection Test Case; HRPD of Low Priority | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 122 | 1 | Clarification on Annex A.9: Measurement performance requirements | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 125 | | E-UTRA TDD – UTRA TDD cell reselection: UTRA is of higher priority | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 126 | | E-UTRA TDD – UTRA TDD cell reselection: UTRA is of lower priority | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 127 | | E-UTRA FDD – UTRA TDD cell reselection | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 128 | 1 | E-UTRA TDD-UTRA TDD cell search (fading) | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 129 | 1 | E-UTRA TDD-UTRA TDD handover | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 132 | 1 | Addition of E-UTRA FDD to UTRA FDD reselection test cases | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 141 | 1 | Correction and introduction of some test related parameters | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 143 | | Description of Annex A in TS 36.133 | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 148 | | Reselection from E-UTRA to GSM cell test case | 8.4.0 | 8.5.0 |
| 2009-03 | RP#43 | RP-090370 | 149 | | Radio Link Monitoring Test Cases | 8.4.0 | 8.5.0 |
| 2009-05 | RP#44 | RP-090546 | 151 | | E-UTRA FDD UTRA TDD HO delay test case | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 153 | | Correction of CQI reporting periodicity for TDD RLM test cases | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 157 | | Correction to inter RAT reselection requirements to exclude | 8.5.0 | 8.6.0 |
| 2009-05 | KF#44 | KF-090546 | 157 | | equal priority. (Technically Endorsed CR in R4-50bis - R4- 091092) | 6.5.0 | 0.0.0 |
| 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) | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 180 | | Correction of Core spec references in A.9 Measurements performance test cases | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 984 | | UTRA FDD-E-UTRA FDD/ TDD handover test cases | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 184 | | SON ANR UTRAN FDD Cell Search Test Case | 8.5.0 | 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 | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 188 | | E-UTRAN FDD cdma2000 HO Test cases | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 190 | | E-UTRAN Random Access Test Cases | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 191 | | E-UTRAN RRC Re-establishment Test Cases | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 192 | | E-UTRAN TDD - GSM Cell Search Test Case in AWGN | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 197 | | Correction to E-UTRAN FDD - GSM Handover Test case | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 173 | 1 | Correction of cell reselection test cases | 8.5.0 | 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 | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 152 | 1 | E-UTRA TDD GSM handover test case | 8.5.0 | 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 | 8.5.0 | 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 | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 185 | 1 | Correction to Radio Link Monitoring Tests | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 203 | | Correction to E-UTRAN FDD to HRPD Cell Reselection Test Case | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090546 | 177 | 1 | Introduction of New Reference Channels and OCNG Patterns for 1.4MHz Bandwidth | 8.5.0 | 8.6.0 |
| 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 conditions | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090547 | 158 | | Alignment of inter frequency and inter RAT RRM reselection testcases with core requirements. (Technically Endorsed CR in R4-50bis - R4-091094) | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090547 | 160 | | Correction relating E-UTRAN TDD - UE Transmit Timing Accuracy Tests. (Technically Endorsed CR in R4-50bis - R4- 091198) | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090547 | 165 | | Modifications of T3 and the verification point for in-sync test cases. (Technically Endorsed CR in R4-50bis - R4-091386) | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090547 | 172 | | E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517) | 8.5.0 | 8.6.0 |
| 2009-05 | RP#44 | RP-090547 | 171 | 1 | Reference measurement Channels for Radio Link Monitoring | 8.5.0 | 8.6.0 |

| 2009-05 RP#44 RP-090548 170 | | | | | | 50bis - R4-091508) | | |
|--|---------|-------|-----------|-----|---|--|-------|-------|
| 2009-05 RP#44 RP-090548 195 Correction to Inter-RAT HO Interruption Time Definition 8.5.0 8 2009-05 RP#44 RP-090548 196 CR c2k RR6 delay 8.5.0 8 2009-05 RP#44 RP-090548 196 CR c2k interruption time 8.5.0 8 2009-05 RP#44 RP-090548 196 Carlifications to UE UL timing requirements. (Technically 8.5.0 8 2009-05 RP#44 RP-090548 196 Corrections of Parthagon Requirements 8.5.0 8 2009-05 RP#44 RP-090548 154 Corrections of TGRP in clause 8.1.2.1.1 8.5.0 8 2009-05 RP#44 RP-090549 161 Corrections of TGRP in clause 8.1.2.1.1 8.5.0 8 2009-05 RP#44 RP-090549 161 E-UTRAN UTRAN HO Command Processing Delay 8.5.0 8 2009-05 RP#44 RP-090549 161 E-UTRAN UTRAN HO Command Processing Delay 8.5.0 8 2009-05 RP#44 RP-090549 161 E-UTRAN UTRAN HO Command Processing Delay 8.5.0 8 2009-05 RP#44 RP-090550 156 Corrections of Cell Reselection Requirements in Ide Mode 8.5.0 8 2009-05 RP#44 RP-090550 156 Corrections of Cell Reselection Requirements 8.5.0 8 2009-05 RP#44 RP-090550 156 Correction to the Reference Glause Number for Tetert. 8.5.0 8 2009-05 RP#44 RP-090551 166 E-UTRAN HOCKNOWN PRINCE FOR THE PRINC | 2009-05 | RP#44 | RP-090548 | 170 | | Misalignment between TS36.133 and TS36.321. (Technically | 8.5.0 | 8.6.0 |
| 2009-05 RP#44 RP-090548 196 CR c2k interruption time 8.5.0 8 2009-05 RP#44 RP-090548 162 Clarifications to UE UL timing requirements. (Technically Endorsed CR in R4-50bis - R4-091357) 8.5.0 8 2009-05 RP#44 RP-090548 176 Correction of Random Access Requirements 8.5.0 8 2009-05 RP#44 RP-090548 168 Correction of TGRP in clause 8.1.2.1.1 8.5.0 8 2009-05 RP#44 RP-090548 168 Correction for TGRP in clause 8.1.2.1.1 8.5.0 8 2009-05 RP#44 RP-090549 161 Correction for the Relative RSRP and RSRQ measurement requirements. (Technically Endorsed CR in R4-50bis - R4-091407) RP#44 RP-090549 175 Corrections for the Relative RSRP and RSRQ measurement requirements. (Technically Endorsed CR in R4-50bis - R4-091407) RP#44 RP-090549 175 Corrections of Cell Reselection Requirements in Idle Mode 8.5.0 8 R4-090549 RP#44 RP-090559 RP#44 RP-090559 RP#44 RP-090559 RP#44 RP-090550 RP#44 RP-090551 RP-090551 RP-090550 RP#44 RP-090550 RP#44 RP-090551 RP-090551 RP-090550 RP#44 RP-090550 RP#45 RP-090880 RP#45 RP-09 | 2009-05 | RP#44 | RP-090548 | 193 | | | 8.5.0 | 8.6.0 |
| 2009-05 RP#44 RP-090548 162 Clarifications to UE UL timing requirements. (Technically 8.5.0 8 2009-05 RP#44 RP-090548 176 Correction of Random Access Requirements 8.5.0 8 2009-05 RP#44 RP-090548 168 Correction of TGRP in clause 8.1.2.1.1 8.5.0 8 2009-05 RP#44 RP-090548 168 Clarifications for the Relative RSRP and RSRC 8.5.0 8 Research Relative RSRP and RSRC | 2009-05 | RP#44 | RP-090548 | 195 | | CR c2k RRC delay | 8.5.0 | 8.6.0 |
| Endorsed CR in R4-50bis - R4-091577 8.5.0 8 | 2009-05 | RP#44 | RP-090548 | 196 | | | 8.5.0 | 8.6.0 |
| 2009-05 RP#44 RP-090548 158 | 2009-05 | RP#44 | RP-090548 | 162 | | | 8.5.0 | 8.6.0 |
| 2009-05 RP#44 RP-090549 161 Clarifications for the Relative RSRP and RSRQ measurement requirements. (Technically Endorsed CR in R4-50bis - R4-091247) 8.5.0 8 R4-50bis - R4-091407) 8.5.0 8 R4-50bis - R4-091247 R4-50bis - R4-091247 R4-091247 R4-091247 R4-091247 R4-091247 R4-091247 R5-090549 181 2 R4-091247 R5-090549 R7-44 R7-090549 181 2 R4-091247 R5-090549 R7-44 R7-090559 181 2 R4-091247 R5-090559 R7-44 R7-090559 R7-44 R7-090550 156 Correction of the TDD-TDD inter frequency measurements. R5-090-05 R7-44 R7-090550 R7-44 R7-090550 R7-44 R7-090550 R7-44 R7-090551 R7-090550 R7-44 R7-090551 R7-090 | 2009-05 | RP#44 | RP-090548 | 176 | | Corrections of Random Access Requirements | 8.5.0 | 8.6.0 |
| measurement requirements. (Technically Endorsed CR in R4-50bis - R4-091407) | 2009-05 | RP#44 | RP-090548 | 154 | | | 8.5.0 | 8.6.0 |
| R4-50his - R4-091407 S-5.0 8 R-444 RP-090549 161 E-UTRAN UTRAN HO Command Processing Delay. (Technically Endorsed CR in R4-50his - R4-091291) S-5.0 8 R-944 RP-090549 175 Corrections of Cell Reselection Requirements in Idle Mode S.5.0 8 R-944 RP-090549 181 2 Removal of Tom ranking criteria in Idle mode cell R-945 R-900550 R-944 RP-090550 156 Correction on the TD-TDD inter frequency measurements. R-950 R-944 RP-090550 R-944 RP-090550 R-944 RP-090550 R-944 RP-090550 R-944 RP-090550 R-944 RP-090551 R-945 RP-090551 R-945 RP-090551 R-945 R-900551 2009-05 | RP#44 | RP-090548 | 168 | | | 8.5.0 | 8.6.0 |
| Technically Endorsed CR in R4-50bis - R4-091291) | | | | | | R4-50bis - R4-091407) | | |
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| reselection reselection reselection reselection reselection Technically Endorsed CR in R4-50bis - R4-091071) | 2009-05 | | | | | • | 8.5.0 | 8.6.0 |
| Crechnically Endorsed CR in R4-50bis - R4-091071) | | RP#44 | | 181 | 2 | reselection | | 8.6.0 |
| Crechnically Endorsed CR in R4-50bis - R4-091153 2009-05 RP#44 RP-090551 169 | | RP#44 | RP-090550 | 156 | | (Technically Endorsed CR in R4-50bis - R4-091071) | 8.5.0 | 8.6.0 |
| Endorsed CR in R4-50bis - R4-091389] Endorsed CR in R4-50bis - R4-091389] Endorsed CR in R4-50bis - R4-091389] Endorsed CR in R4-50bis - R4-091410] Endorsed CR in R4-50bis - R4-091083] Endorsed CR in R | | | | | | (Technically Endorsed CR in R4-50bis - R4-091153) | | 8.6.0 |
| 2009-05 RP#44 RP-090551 169 CONG simplification, (Technically Endorsed CR in R4-50bis - 8.5.0 8 R4-09055 RP#44 RP-090559 155 Introduction of Extended LTE800 requirements. (Technically 8.6.0 9 Endorsed CR in R4-50bis - R4-091063) 2009-05 RP#45 RP-090817 211 Correction to TDD RMC references in RLM test cases 9.0.0 9 2009-05 RP#45 RP-090880 205 Introduction of Reference DRX configurations 9.0.0 9 2009-05 RP#45 RP-090880 205 Introduction of Reference DRX configurations 9.0.0 9 2009-05 RP#45 RP-090880 225 Correction to TD RX configurations into no DRX test cases 9.0.0 9 2009-05 RP#45 RP-090880 227 Correction to HO Test Cases 9.0.0 9 2009-05 RP#45 RP-090880 227 Correction to E-UTRAN GSM BSIC Identification 9.0.0 9 Requirements with DRX Requirements with DRX Requirements with DRX Requirements with DRX Requirements with DRX RP-090880 231 E-UTRA FDD - E-UTRA FDD and UTRA FDD cell search test 9.0.0 9 209-05 RP#45 RP-090880 314 E-UTRA FDD - E-UTRA FDD and UTRA FDD cell search test 9.0.0 9 209-05 RP#45 RP-090880 316 Inter-frequency E-UTRA - E-UTRA HO test cases: unknown 9.0.0 9 209-05 RP#45 RP-090880 316 Inter-frequency E-UTRA - E-UTRA HO test cases: unknown 9.0.0 9 209-05 RP#45 RP-090830 283 2 E-UTRA FDD UTRA FDD Blind Handover test cases: unknown target cell Unknown target cell 9.0.0 9 209-05 RP#45 RP-090836 285 1 E-UTRA M GSM Cell Search in DRX Test Cases 9.0.0 9 209-05 RP#45 RP-090836 285 1 E-UTRA TDD to UTRA TDD cell search in DRX 9.0.0 9 209-05 RP#45 RP-090836 287 Set 3.2 E-UTRA TDD to UTRA TDD cell search in DRX 9.0.0 9 209-05 RP#45 RP-090836 287 E-UTRA M GSM Cell Search in DRX Test Cases 9.0.0 9 209-05 RP#45 RP-090836 287 E-UTRAN TDD cell search in DRX Test Cases 9.0.0 9 209-05 RP#45 RP-090836 287 E-UTRAN TDD cell search in DRX Test Cases 9.0.0 9 209-05 RP#45 RP-090836 28 | | | | | | Endorsed CR in R4-50bis - R4-091389) | | 8.6.0 |
| R4-091410 R4-090559 155 Introduction of Extended LTE800 requirements. (Technically Endorsed CR in R4-50bis - R4-091063) Section 1 | | | | | | | | 8.6.0 |
| Endorsed CR in R4-50bis - R4-091063 9.0.0 9 2009-05 RP#45 RP-090880 205 Introduction of Reference DRX configurations 9.0.0 9 9.0.0 9 2009-05 RP#45 RP-090880 207 Addition of DRX configurations into non DRX test cases 9.0.0 9 2009-05 RP#45 RP-090880 227 Correction to FO Test Cases 9.0.0 9 2009-05 RP#45 RP-090880 227 Correction to E-UTRAN GSM BSIC Identification 9.0.0 9 2009-05 RP#45 RP-090880 259 Correction to E-UTRAN GSM BSIC Identification 9.0.0 9 2009-05 RP#45 RP-090880 314 E-UTRA FDD -E-UTRA FDD and UTRA FDD cell search test 6.00 9.0.0 9 2009-05 RP#45 RP-090880 315 E-UTRAN Radio Link Monitoring Test Cases in DRX 9.0.0 9 2009-05 RP#45 RP-090880 316 Inter-frequency E-UTRA -E-UTRA HO test cases: unknown 9.0.0 9 2009-05 RP#45 RP-090880 316 Inter-frequency E-UTRA -E-UTRA HO test cases: unknown 9.0.0 9 2009-05 RP#45 RP-090880 316 Inter-frequency E-UTRA -E-UTRA HO test cases: unknown 9.0.0 9 2009-05 RP#45 RP-090880 321 Is Small corrections to Measurements performance tests 9.0.0 9 2009-05 RP#45 RP-090836 321 Is Small corrections to Measurements performance tests 9.0.0 9 2009-05 RP#45 RP-090836 267 Is Small corrections to Measurements performance tests 9.0.0 9 2009-05 RP#45 RP-090836 267 Is Small corrections to Measurements performance tests 9.0.0 9 2009-05 RP#45 RP-090836 267 Is Set 3.12 E-UTRA TDD to UTRA TDD cell search in DRX 9.0.0 9 2009-05 RP#45 RP-090836 267 Is Set 3.12 E-UTRA TDD to UTRA TDD to E-UTRA TDD and 9.0.0 9 2009-05 RP#45 RP-090836 271 Set 3.12 E-UTRA TDD to UTRA TDD bell handover test 9.0.0 9 2009-05 RP#45 RP-090836 271 Set 3.12 E-UTRA TDD to UTRA TDD bell handover test 9.0.0 9 2009-05 RP#45 RP-090836 271 Set 3.12 E-UTRA TDD to UTRA TDD bell handover test 9.0.0 9 2009-05 RP#45 RP-090836 281 E-UTRAN FDD -UTRAN FDD Cel | | | | | | R4-091410) | | 8.6.0 |
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| 2009-05 RP#45 RP-090880 225 Correction to HO Test Cases 9.0.0 9 2009-05 RP#45 RP-090880 227 Correction to E-UTRAN GSM BSIC Identification 9.0.0 9 2009-05 RP#45 RP-090880 259 Corrections of Test Cases 9.0.0 9 2009-05 RP#45 RP-090880 314 E-UTRAN FDD - E-UTRA FDD and UTRA FDD cell search test 9.0.0 9 2009-05 RP#45 RP-909880 315 E-UTRAN Radio Link Monitoring Test Cases in DRX 9.0.0 9 2009-05 RP#45 RP-909880 316 Inter-frequency E-UTRA - E-UTRA HO test cases: unknown farget cell 9.0.0 9 2009-05 RP#45 RP-909880 263 2 E-UTRA FDD UTRA FDD Blind Handover test case: unknown farget cell 9.0.0 9 2009-05 RP#45 RP-090836 281 1 Small corrections to Measurements performance tests 9.0.0 9 2009-05 RP#45 RP-090836 285 1 E-UTRAN GSM Cell Search in DRX Test Cases 9.0.0 9 | | - | | | | | | 9.1.0 |
| 2009-05 RP#45 RP-090880 227 Correction to E-UTRAN GSM BSIC Identification Requirements with DRX 9.0.0 9 2009-05 RP#45 RP-090880 259 Corrections of Test Cases 9.0.0 9 2009-05 RP#45 RP-090880 314 E-UTRA FDD - E-UTRA FDD and UTRA FDD cell search test 9.0.0 9 2009-05 RP#45 RP-090880 315 E-UTRA RAdio Link Monitoring Test Cases in DRX 9.0.0 9 2009-05 RP#45 RP-090880 316 Inter-frequency E-UTRA - E-UTRA HO test cases: unknown target cell 9.0.0 9 2009-05 RP#45 RP-090880 263 2 E-UTRA FDD UTRA FDD Blind Handover test case: unknown target cell 9.0.0 9 2009-05 RP#45 RP-090836 321 1 Small corrections to Measurements performance tests 9.0.0 9 2009-05 RP#45 RP-090836 285 1 E-UTRAN GSM Cell Search in DRX Test Cases 9.0.0 9 2009-05 RP#45 RP-090836 267 Set 3.2 E-UTRAN TDD to UTRA TDD to E-UT | | | | | | | | 9.1.0 |
| Requirements with DRX 2009-05 RP#45 RP-090880 259 Corrections of Test Cases 9.0.0 9 2009-05 RP#45 RP-090880 314 E-UTRA FDD -E-UTRA FDD and UTRA FDD cell search test 9.0.0 9 2009-05 RP#45 RP-090880 315 E-UTRAN Radio Link Monitoring Test Cases in DRX 9.0.0 9 2009-05 RP#45 RP-090880 316 Inter-frequency E-UTRA -E-UTRA HO test cases: unknown 9.0.0 9 2009-05 RP#45 RP-090880 263 2 E-UTRA FDD Blind Handover test case: unknown target cell 2009-05 RP#45 RP-090836 321 1 Small corrections to Measurements performance tests 9.0.0 9 2009-05 RP#45 RP-090836 267 Set 3.2 E-UTRA FDD Blind Handover test Cases 9.0.0 9 2009-05 RP#45 RP-090836 267 Set 3.2 E-UTRA TDD to UTRA TDD cell search in DRX 9.0.0 9 2009-05 RP#45 RP-090836 267 Set 3.2 E-UTRA TDD to UTRA TDD to E-UTRA TDD and UTRA TDD combined cell search under fading 2009-05 RP#45 RP-090836 271 Set 3.12 E-UTRA TDD to UTRA TDD blind handover test 9.0.0 9 2009-05 RP#45 RP-090836 271 Set 3.12 E-UTRAN TDD coll search in DRX Test 9.0.0 9 2009-05 RP#45 RP-090836 271 Set 3.12 E-UTRA TDD to UTRA TDD blind handover test 9.0.0 9 2009-05 RP#45 RP-090836 279 E-UTRAN TDD -UTRAN TDD Cell Search in DRX Test 9.0.0 9 2009-05 RP#45 RP-090836 281 E-UTRAN TDD -UTRAN TDD and E-UTRAN TDD Inter-frequency Cell Search Test Cases 9.0.0 9 2009-05 RP#45 RP-090836 287 E-UTRAN GSM Blind Handover Test Cases 9.0.0 9 2009-05 RP#45 RP-090836 287 E-UTRAN FDD -E-UTRAN | | | | | | | | 9.1.0 |
| 2009-05 | | | | | | Requirements with DRX | | 9.1.0 |
| Cases 2009-05 RP#45 RP-090880 315 E-UTRAN Radio Link Monitoring Test Cases in DRX 9.0.0 9 9 9 9 9 9 9 9 9 | | - | | | | | | 9.1.0 |
| 2009-05 RP#45 RP-090880 263 2 E-UTRA - E-UTRA HO test cases: unknown target cell 2009-05 RP#45 RP-090880 263 2 E-UTRA FDD UTRA FDD Blind Handover test case: 9.0.0 9 9 9.0.0 9 9 9 9 9 9 9 9 9 | | | | | | cases | | 9.1.0 |
| target cell | | | | | | | | 9.1.0 |
| Unknown target cell Small corrections to Measurements performance tests 9.0.0 9 9 9 9 9 9 9 9 9 | | | | | 0 | target cell | | 9.1.0 |
| Description | | | | | | unknown target cell | | 9.1.0 |
| 2009-05 RP#45 RP-090836 267 Set 3.2. E-UTRA TDD to UTRA TDD cell search in DRX under fading 9.0.0 9 2009-05 RP#45 RP-090836 269 Set 3.6. Test case of E-UTRA TDD to E-UTRA TDD and UTRA TDD combined cell search under fading 9.0.0 9 2009-05 RP#45 RP-090836 271 Set 3.12. E-UTRA TDD to UTRA TDD blind handover test 9.0.0 9 2009-05 RP#45 RP-090836 279 E-UTRAN FDD - UTRAN FDD Cell Search in DRX Test Cases 9.0.0 9 2009-05 RP#45 RP-090836 281 E-UTRAN TDD- E-UTRAN TDD and E-UTRAN TDD Interfrequency Cell Search Test Case 9.0.0 9 2009-05 RP#45 RP-090836 283 E-UTRAN GSM Blind Handover Test Cases 9.0.0 9 2009-05 RP#45 RP-090836 287 E-UTRAN FDD cdma2000 Blind HO Test cases 9.0.0 9 2009-05 RP#45 RP-090836 302 RRM Test case for multiple E-UTRAN FDD-FDD Interfrequency event triggered reporting under fading propagation conditions 9.0.0 9 2009-05 RP#45 RP-090836 304 | | | | | | parameters | | 9.1.0 |
| Under fading | | | | | 1 | | | 9.1.0 |
| UTRA TDD combined cell search under fading | | | | | | under fading | | 9.1.0 |
| 2009-05 RP#45 RP-090836 279 E-UTRAN FDD - UTRAN FDD Cell Search in DRX Test Cases 9.0.0 9 2009-05 RP#45 RP-090836 281 E-UTRAN TDD- E-UTRAN TDD and E-UTRAN TDD Interfrequency Cell Search Test Case 9.0.0 9 2009-05 RP#45 RP-090836 283 E-UTRAN GSM Blind Handover Test Cases 9.0.0 9 2009-05 RP#45 RP-090836 287 E-UTRAN FDD cdma2000 Blind HO Test cases 9.0.0 9 2009-05 RP#45 RP-090836 302 RRM Test case for multiple E-UTRAN FDD-FDD Interfrequency event triggered reporting under fading propagation conditions 9.0.0 9 2009-05 RP#45 RP-090836 304 Fading reselection test case between E-UTRA and UTRA (UTRA of lower priority) 9.0.0 9 2009-05 RP#45 RP-090879 215 1 Corrections to Measurements of HRPD cells and cdma2000 9.0.0 9 2009-05 RP#45 RP-090879 231 CR reference correction 9.0.0 9 2009-05 RP#45 RP-090879 231 CR reference correction | | | | | | UTRA TDD combined cell search under fading | | 9.1.0 |
| Cases Cases | | | | | | | | 9.1.0 |
| Search Test Case 1 | | | | | | Cases | | 9.1.0 |
| 2009-05 RP#45 RP-090836 287 E-UTRAN FDD cdma2000 Blind HO Test cases 9.0.0 9 2009-05 RP#45 RP-090836 302 RRM Test case for multiple E-UTRAN FDD-FDD Interfrequency event triggered reporting under fading propagation conditions 9.0.0 9 2009-05 RP#45 RP-090836 304 Fading reselection test case between E-UTRA and UTRA (UTRA of lower priority) 9.0.0 9 2009-05 RP#45 RP-090828 233 CR SI HRPD correction 9.0.0 9 2009-05 RP#45 RP-090879 215 1 Corrections to Measurements of HRPD cells and cdma2000 9.0.0 9 2009-05 RP#45 RP-090879 231 CR reference correction 9.0.0 9 2009-05 RP#45 RP-090879 235 1 Corrections to Measurements of GSM cells in RRC_IDLE 9.0.0 9 2009-05 RP#45 RP-090879 247 Range of Idle Mode Es/lot side conditions 9.0.0 9 | | | | | | frequency Cell Search Test Case | | 9.1.0 |
| 2009-05 RP#45 RP-090836 302 RRM Test case for multiple E-UTRAN FDD-FDD Interfrequency event triggered reporting under fading propagation conditions 9.0.0 9 2009-05 RP#45 RP-090836 304 Fading reselection test case between E-UTRA and UTRA (UTRA of lower priority) 9.0.0 9 2009-05 RP#45 RP-090828 233 CR SI HRPD correction 9.0.0 9 2009-05 RP#45 RP-090879 215 1 Corrections to Measurements of HRPD cells and cdma2000 9.0.0 9 2009-05 RP#45 RP-090879 231 CR reference correction 9.0.0 9 2009-05 RP#45 RP-090879 235 1 Corrections to Measurements of GSM cells in RRC_IDLE 9.0.0 9 2009-05 RP#45 RP-090879 247 Range of Idle Mode Es/lot side conditions 9.0.0 9 | | | | | | | | 9.1.0 |
| Second conditions Interest | | | | | | | | 9.1.0 |
| 2009-05 RP#45 RP-090836 304 Fading reselection test case between E-UTRA and UTRA (UTRA of lower priority) 9.0.0 9 2009-05 RP#45 RP-090828 233 CR SI HRPD correction 9.0.0 9 2009-05 RP#45 RP-090879 215 1 Corrections to Measurements of HRPD cells and cdma2000 9.0.0 9 2009-05 RP#45 RP-090879 231 CR reference correction 9.0.0 9 2009-05 RP#45 RP-090879 235 1 Corrections to Measurements of GSM cells in RRC_IDLE 9.0.0 9 2009-05 RP#45 RP-090879 247 Range of Idle Mode Es/lot side conditions 9.0.0 9 | 2009-05 | RP#45 | KP-090836 | 302 | | frequency event triggered reporting under fading propagation | 9.0.0 | 9.1.0 |
| 2009-05 RP#45 RP-090879 215 1 Corrections to Measurements of HRPD cells and cdma2000 9.0.0 9 2009-05 RP#45 RP-090879 231 CR reference correction 9.0.0 9 2009-05 RP#45 RP-090879 235 1 Corrections to Measurements of GSM cells in RRC_IDLE 9.0.0 9 2009-05 RP#45 RP-090879 247 Range of Idle Mode Es/lot side conditions 9.0.0 9 | | RP#45 | RP-090836 | 304 | | (UTRA of lower priority | 9.0.0 | 9.1.0 |
| 2009-05 RP#45 RP-090879 231 CR reference correction 9.0.0 9 2009-05 RP#45 RP-090879 235 1 Corrections to Measurements of GSM cells in RRC_IDLE 9.0.0 9 2009-05 RP#45 RP-090879 247 Range of Idle Mode Es/lot side conditions 9.0.0 9 | | | | | | | | 9.1.0 |
| 2009-05 RP#45 RP-090879 235 1 Corrections to Measurements of GSM cells in RRC_IDLE 9.0.0 9 2009-05 RP#45 RP-090879 247 Range of Idle Mode Es/lot side conditions 9.0.0 9 | 2009-05 | RP#45 | RP-090879 | | 1 | 1X | 9.0.0 | 9.1.0 |
| 2009-05 RP#45 RP-090879 247 Range of Idle Mode Es/lot side conditions 9.0.0 9 | | | | | | | | 9.1.0 |
| | | | | | 1 | | | 9.1.0 |
| 2009-05 RP#45 RP-090879 249 Removal of [] from Tdetect, Tmeasure and Tevaluate 9.0.0 9 | | | | | | | | 9.1.0 |
| | | | | | | | | 9.1.0 |
| 2009-05 RP#45 RP-090879 245 1 Clarification to applicability of RSRP side conditions in Idle 9.0.0 9 mode | 2009-05 | KP#45 | RP-090879 | 245 | 1 | | 9.0.0 | 9.1.0 |

| 2009-05 | RP#45 | RP-090879 | 317 | | CR Idle mode IF measurement condition | 9.0.0 | 9.1.0 |
|--------------------|----------------|------------------------|------------|---|---|----------------|-------|
| 2009-05 | RP#45 | RP-090879 | 318 | | CR Idle mode IF measurement period | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090879 | 217 | 2 | Corrections to E-UTRAN RRC_IDLE state mobility requirements | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090814 | 265 | 1 | Correction to Random Access | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090816 | 221 | | E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090816 | 223 | | E-UTRAN inter RAT measurement requirements | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090816 | 229 | | Correction to Monitoring of Multiple Layers Using Gaps | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090816 | 219 | 1 | E-UTRAN FDD-FDD inter frequency measurements when DRX is used | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090816 | 322 | | CR GSM measurement period | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090816 | 323 | | CR cdma2000 1x and HRPD number of carriers | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090816 | 213 | 1 | Editorial correction on E-UTRAN inter frequency measurements | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090816 | 261 | 1 | E-UTRAN TDD intra frequency measurements | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090816 | 319 | 1 | Clarification of the number of monitoring cells for intra frequency measurements | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090815 | 237 | | Correction of timing advance adjustment accuracy test case | 9.0.0 | 9.1.0 |
| 2009-05 | RP#45 | RP-090815 | 291 | | Correction to UE Transmit Timing Requirements | 9.0.0 | 9.1.0 |
| 2009-12 | RP-46 | RP-091275 | 329 | | Defining requirements for UTRA TDD measurements for | 9.1.0 | 9.2.0 |
| 0000 10 | DD 40 | DD 004070 | 000 | | SON (Technically endorsed at RAN 4 52bis in R4-093512) | 0.4.0 | 0.00 |
| 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) | 9.1.0 | 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) | 9.1.0 | 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) | 9.1.0 | 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 R4-093686) | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091271 | 338 | | Correction of missing accuracy requirements for UTRAN FDD (Technically endorsed at RAN 4 52bis in R4-093689) | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091275 | 340 | | CR cdma2000 HRPD measurement period (Technically endorsed at RAN 4 52bis in R4-093720) | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091275 | 342 | | CR cdma2000 1x measurement period (Technically endorsed at RAN 4 52bis in R4-093721) | 9.1.0 | 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) | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091272 | 346 | | Revise geometry factors for Intra freq Reselection Test Cases | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091271 | 348 | | Corrections on RRM parameters for Bands 12, 14, 17 | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091271 | 351 | 1 | Corrections to PDSCH RMC-s | 9.1.0 | 9.2.0 |
| 2009-12 2009-12 | RP-46 RP-46 | RP-091271 RP-091275 | 353 356 | 1 | UTRA TDD P-CCPCH RSCP absolute accuracy | 9.1.0 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091275 | 358 | 1 | measurement in E-UTRAN E-UTRAN TDD - UTRAN TDD cell search for SON | 0.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091275 | 361 | ı | Cell Search Requirements for Intra-LTE Handover to | 9.1.0 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091273 | 365 | | Unknown Target Cell Combined E-UTRAN interfrequency and GSM cell search | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091271 | 367 | 1 | test cases (Scenario set 3.2) Correction in UE UTRA TDD P-CCPCH RSCP measurement capability for R9 | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091273 | 374 | | E-UTRAN GSM RSSI Measurement Accuracy Tests | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091273 | 375 | | E-UTRAN UTRAN FDD CPICH RSCP Measurement | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091273 | 376 | | Accuracy Tests E-UTRAN UTRAN FDD CPICH Ec/No Measurement | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091275 | 378 | | Accuracy Tests Cell Timing Change Requirements for Event Triggered Reporting | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091271 | 380 | | Correction to Power Headroom Requirements | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091271 | 382 | | Editorial corrections to 36.133 | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091271 | 387 | | Editorial corrections to the time units for RRC Re- establishment test cases | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091272 | 389 | 1 | Introduction of cell search test case in DRX to verify L3 filtering | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091271 | 391 | | Correction to ONCG Patterns | 9.1.0 | 9.2.0 |
| 2009-12 | RP-46 | RP-091275 | 329 | | Defining requirements for UTRA TDD measurements for | 9.1.0 | 9.2.0 |
| 2005 :- | | | | | SON (Technically endorsed at RAN 4 52bis in R4-093512) | | 1 |
| 2009-12 | RP-46 | RP-091272 | 332 | | Modification of test case of E-UTRA TDD intra frequency cell | 9.1.0 | 9.2.0 |

| | | | | | reselection (Technically endorsed at RAN 4 52bis in R4- 093552) | | |
|-------------------------------|----------------|------------------------|------------|--|---|----------------|-------|
| 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) | 9.1.0 | 9.2.0 |
| 2010-03 | RP-47 | RP-100254 | 410 | | Idle mode corrections | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100254 | 405 | 1 | UE measurement capability requirements in Idle and Connected | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100254 | 423 | ' | Correction to UE Measurement Capability Requirements in Idle Mode | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100254 | 412 | | Removal of activation time from interRAT handover requirements | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100254 | 417 | 1 | Correction to UE Transmit Timing Requirements | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100254 | 402 | - | Correction of E-UTRAN TDD inter frequency measurements R9 | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100254 | 414 | 1 | Enhanced GSM Requirements for CSFB | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100254 | 415 | 1 | Enhanced UTRA FDD Requirements for CSFB | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100255 | 399 | | Correction of RSRP value in E-UTRAN FDDFDD Inter frequency reselection test | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100255 | 397 | | Addition of missing Es/Noc parameters in RRM test cases | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100255 | 421 | | Correction to RRC Re-establishment Test Case | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100255 | 427 | 1 | Correction of UE transmit timing test case | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100255 | 419 | 1 | Correction to RLM Test Cases | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100255 | 407 | | Editorial Corrections in TS36.133(Rel-9) | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100263 | 413 | | Introduction of LTE in 800 MHz for Europe requirements in | 9.2.0 | |
| | | | | | TS 36.133 | | 9.3.0 |
| 2010-03 | RP-47 | RP-100264 | 395 | - | Corrections for Extended UMTS1500 in TS36.133(Rel-9) | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100269 | 393 | <u> </u> | AOA and TA measurement report mappings | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100269 | 403 | 2 | Mapping of UE RxTx time difference measurement | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100266 | 425 | 2 | Home eNode B synchronization requirement | 9.2.0 | 9.3.0 |
| 2010-03 | RP-47 | RP-100266 | 424 | 2 | Minimum requirements on SI reading for HeNB inbound mobility | 9.2.0 | 9.3.0 |
| 2010-06 | RP-48 | RP-100622 | 473 | | Clarification on radio link monitoring | 9.3.0 | 9.4.0 |
| 2010-06 | | | | | Corrections of clause numbering on the test case of E- UTRAN FDD-FDD inter-frequency cell search requirements | 9.3.0 | 9.4.0 |
| | RP-48 | RP-100622 | 472 | | for L3 fitering | | |
| 2010-06 | RP-48 | RP-100622 | 466 | 1 | Correction to RRM Test Cases | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 | RP-100622 | 464 | | Correction to RRM Requirements | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 | RP-100622 | 462 | 1 | Correction to Absolute RSRP/RSRQ Definitions | 9.3.0 | 9.4.0 |
| 2010-06 2010-06 | RP-48 | RP-100622 | 457 | | UE Measurement Capability Requirements for CDMA2000 Correction of E-UTRAN Inter-frequency Cell Re-selection | 9.3.0 9.3.0 | 9.4.0 |
| 2040.00 | RP-48 RP-48 | RP-100622 | 455 | 1 | Requirements | 0.00 | 0.40 |
| 2010-06 | | RP-100622 | 451 | 1 | Correction to idle mode requirements(Rel-9) | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 RP-48 | RP-100622 | 449 447 | 1 | Editorial corrections to 36.133(Rel-9) | 9.3.0 | 9.4.0 |
| 2010-06 2010-06 | RP-48 | RP-100622 RP-100622 | 441 | 1 | Correction to TDD intrafrequency accuracy test case Correction of lo value in E-UTRAN FDD and TDD Inter | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 | RP-100622 RP-100627 | 444 | 2 | frequency RSRP tests | 0.2.0 | 0.40 |
| 2010-06 2010-06 | RP-48 | RP-100627 RP-100627 | 444 | 1 | Corrections to CSG SI reading core requirement RSRQ idle mode requirements | 9.3.0 | 9.4.0 |
| 2010-06 2010-06 | RP-48 | RP-100627 RP-100630 | 445 | 1 | Test cases for R9 cell reselection enhancements | 9.3.0 | 9.4.0 |
| 2010-06 2010-06 | RP-48 | RP-100630 | 460 | - | Missing E-UTRA - UTRA FDD DRX Requirements | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 | RP-100630 | 442 | 2 | Corrections to enhanced cell identification core requirement | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 | RP-100632 | 469 | 2 | Applicability of mobility requirements with inter-frequency RSTD measurements | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 | RP-100632 | 439 | | UE Rx-Tx Time Difference Measurement Requirements for E-CID | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 | RP-100632 | 438 | 2 | CR UE RX-TX time-difference measurement requirement | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 | RP-100632 | 433 | 5 | RSTD Measurement Requirements for OTDOA | 9.3.0 | 9.4.0 |
| 2010-06 | RP-48 | RP-100632 | 432 | 5 | RSTD Accuracy Requirements for OTDOA | 9.3.0 | 9.4.0 |
| 2010-09 | RP-49 | RP-100914 | 477 | 1 | Cell identity change time in RRM Test cases | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100919 | 537 | <u> </u> | A clarification text in the RSTD intra-frequency accuracy requirements | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 506 | | Correction of drx-RetransmissionTimer parameters | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 508 | | Correction of lo value in RSRP FDD and TDD Intra frequency | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 521 | 1 | test Editorial corrections to 36.133 (R9) | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 RP-100914 | 523 | <u> </u> | Alignment of REFSENS between 36.101 and 36.133(R9) | 9.4.0 | 9.5.0 |
| / U I U-UM | | | | 1 | | | |
| | RP-49 | RP-100920 | 525 | 1 | Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) | 9.4.0 9.4.0 | 9.5.0 |
| 2010-09 | DD 40 | | | | | | 9.5.0 |
| 2010-09 2010-09 2010-09 | RP-49 RP-49 | RP-100915 RP-100920 | 505 528 | 1 | E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case | 9.4.0 | 9.5.0 |

| 2040.00 | DD 40 | DD 400040 | L 500 | | Enhanced CCED Descriptions and with DDV | 0.40 | 0.50 |
|---------|-------|------------------------|------------|---|---|--------|----------|
| 2010-09 | RP-49 | RP-100919 | 539 | | Enhanced CSFB Requirements with DRX | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100919 | 540 | 4 | Correction to E-CID Requirements | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 544 | 1 | Addition of UTRA and GSM enhanced cell identification test | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 547 | 1 | cases E-UTRAN FDD UE Rx – Tx Time Difference Measurement | 9.4.0 | 9.5.0 |
| | | | | | Accuracy test case | | |
| 2010-09 | RP-49 | RP-100914 | 479 | 1 | Scrambling code change time in RRM Test cases | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100914 | 549 | | Introduction of CSG cell reselection requirements | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 527 | | correction of redundant Hysteresis(Hys) for 36.133(R9) | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 488 | 2 | Test case for TDD UE Rx-Tx time difference measurement | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100914 | 483 | | Clarification of Radio link monitoring test cases | 9.4.0 | 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 | 9.4.0 | 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 | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100924 | 492 | | Test case for E-UTRAN TDD in the existence of non-allowed CSG cell | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 494 | | PDCCH Aggregation level for RRM tests | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 503 | | Correction of ES/lot value in E-UTRAN RSRQ FDD intra frequency test | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 496 | | Corrections to RRM OCNG Patterns | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100919 | 498 | | RRC timer accuracy requirement | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 501 | | Correction of OCNG | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100914 | 477 | 1 | Cell identity change time in RRM Test cases | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100919 | 537 | | A clarification text in the RSTD intra-frequency accuracy requirements | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 506 | | Correction of drx-RetransmissionTimer parameters | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 508 | | Correction of Io value in RSRP FDD and TDD Intra frequency test | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 521 | 1 | Editorial corrections to 36.133 (R9) | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100914 | 523 | | Alignment of REFSENS between 36.101 and 36.133(R9) | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 525 | 1 | Correction of Time to Trigger unit for 36.133(R9) | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 505 | 1 | Corrections to 36.133(R9) | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 528 | 1 | E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100919 | 538 | 1 | Correction to Enhanced BSIC Verification Requirements | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100919 | 539 | | Enhanced CSFB Requirements with DRX | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100919 | 540 | | Correction to E-CID Requirements | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 544 | 1 | Addition of UTRA and GSM enhanced cell identification test cases | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 547 | 1 | E-UTRAN FDD UE Rx – Tx Time Difference Measurement Accuracy test case | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100914 | 479 | 1 | Scrambling code change time in RRM Test cases | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100914 | 549 | | Introduction of CSG cell reselection requirements | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 527 | | correction of redundant Hysteresis(Hys) for 36.133(R9) | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100920 | 488 | 2 | Test case for TDD UE Rx-Tx time difference measurement | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100914 | 483 | | Clarification of Radio link monitoring test cases | 9.4.0 | 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 | 9.4.0 | 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 | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100924 | 492 | | Test case for E-UTRAN TDD in the existence of non-allowed CSG cell | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 494 | | PDCCH Aggregation level for RRM tests | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 503 | | Correction of ES/lot value in E-UTRAN RSRQ FDD intra frequency test | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 496 | | Corrections to RRM OCNG Patterns | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100919 | 498 | | RRC timer accuracy requirement | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100915 | 501 | | Correction of OCNG | 9.4.0 | 9.5.0 |
| 2010-09 | RP-49 | RP-100927 | 497 | | CR LTE_TDD_2600_US spectrum band definition additions to TS 36.133 | 9.5.0 | 10.0.0 |
| 2010-12 | RP-50 | RP-101331 | 635 | | Corrections to 36.133 performance requirements | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101331 | 638 | | Correction to intra frequency cell identification time for FDD and TDD | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101331 | 566 | 1 | Corrections and Clarifications to TS36.133 | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101331 | 592 | 2 | Correction to Radio link monitoring test cases | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101332 | 563 | | PDCCH Aggregation Level for RRM Tests | 10.0.0 | 10.1.0 |
| | | | | | | | 1 40 4 0 |
| 2010-12 | RP-50 | RP-101332 | 571 | | MIMO correlation scenario for RLM test cases | 10.0.0 | 10.1.0 |
| | | RP-101332 RP-101332 | 571 580 | | MIMO correlation scenario for RLM test cases Removal of [] from PDSCH and PCFICH/PDCCH/PHICH Measurement Channel references in Annex A. | 10.0.0 | 10.1.0 |

| 2010-12 2010-12 | RP-50 RP-50 | RP-101332 RP-101335 | 585 643 | 1 | Enabling HARQ for RRM Tests Completion of CSG cell reselection requirements | 10.0.0 | 10.1.0 |
|--------------------|----------------|------------------------|------------|---|---|--------|--------|
| 2010-12 | RP-50 RP-50 | RP-101335 RP-101343 | 568 | 1 | Clarification of CSG cell reselection requirements Clarification of measurements requirements for HRPD and cdma2000 1x | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101343 | 589 | | Addition of Band 18, 19 and 21 into UE Rx - Tx time difference requirements | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101343 | 604 | | Correction to Enhanced GSM Cell Identification Requirement | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101343 | 632 | | Correction of reselection requirement for UTRAN FDD cells | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101343 | 640 | | Correction to Enhanced UTRA FDD Cell Identification Requirements | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101343 | 645 | | E-UTRAN TDD Intra Frequency RSTD Measurement Accuracy test case | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101343 | 621 | 1 | Correction for Measurements of inter-RAT cells | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101343 | 598 | 2 | E-UTRAN FDD intra-frequency RSTD measurement reporting delay test case | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101343 | 600 | 2 | E-UTRAN TDD intra-frequency RSTD measurement reporting delay test case | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101356 | 644 | | Band 42 and 43 parameters for UMTS/LTE 3500 (TDD) for TS 36.133 | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101361 | 552 | | Introduction of L-band in TS36.133 | 10.0.0 | 10.1.0 |
| 2010-12 | RP-50 | RP-101388 | 648 | | Removal of square brackets from scope of TS36.133 | 10.0.0 | 10.1.0 |
| 2011-04 | RP-51 | RP-110359 | 0658 | - | Addition of UE RRM capabilities for CA | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110340 | 0663 | - | Correction to E-UTRAN TDD in-sync test requirements | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110348 | 0665 | 1 | RSTD requirements, RMC and OCNG patterns | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110350 | 0669 | - | CR to 36.133: Aligning relavant RRM requirements for Band 41 with the reference sensitivity values in 36.101 | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110339 | 0676 | - | Modification on test case of E-UTRA TDD to UTRA TDD cell reselection(R10) | 10.1.0 | 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 | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110339 | 0687 | 1 | Rearrangement of Time periods for EUTRA-UTRA reselection test case A.4.3.1.1 | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110339 | 0690 | 1 | Removal of "Force to Cell 2" during initialisation for EUTRA- UTRA reselection test case A.4.3.1.2 | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110340 | 0693 | 1 | SNR for RRM A.8.x test cases using ETU70 | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110408 | 0697 | 1 | Requirements for Minimaztion of Drive Tests (MDT) in LTE | 10.1.0 | 1000 |
| 2011-04 | RP-51 | RP-110339 | 0703 | - | Correction to test cases of E-UTRA to UTRA cell reselection when UE is in idle state | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110359 | 0706 | 2 | Introduction of measurement requirements for carrier aggregation | 10.1.0 | 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 DRX for Rel- 10 | 10.1.0 | 10.2.0 |
| 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- | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110359 | 0713 | 1 | Introduction of core requirements of radio link monitoring in CA | 10.1.0 | 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) | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110348 | 0727 | 2 | Requirements for reporting criteria with positioning measurements | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110340 | 0736 | - | Correction of RLM evaluation period in DRX | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110340 | 0739 | - | Correction of inter-frequency measurement accuracy test cases | 10.1.0 | 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) | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110348 | 0747 | 1 | Corrections to RSTD measurement for Rel-9 | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110348 | 0748 | - | Correction on FDD Intra Frequency RSTD Measurement Accuracy test case | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110348 | 0751 | 1 | RSTD test case corrections | 10.1.0 | 10.2.0 |
| 2011-04 | RP-51 | RP-110344 | 0753 | - | Correction of serving cell performance requirements for autonomous SI acquisition | 10.1.0 | 10.2.0 |
| 2011-06 | RP-52 | RP-110753 | 0785 | 1 | Simplification of frequency dependent requirements in 36.133 (Table B.2.2-1 contains erroneous values. These wrong values will be corrected in the RAN#53 meeting.) | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110793 | 754 | | E-UTRAN FDD-FDD inter-frequency RSTD measurement reporting delay test case with the reference cell on the serving carrier frequency | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110793 | 755 | | E-UTRAN TDD-TDD inter-frequency RSTD measurement reporting delay test case with the reference cell on the serving carrier frequency | 10.2.0 | 10.3.0 |

| 2011-06 | RP-52 | RP-110807 | 757 | | Core requirements on RRC connection mobility control in CA | 10.2.0 | 10.3.0 |
|--------------------|----------------|------------------------|------------|---|--|--------|--------|
| 2011-06 | RP-52 | RP-110807 | 758 | | Timing core requirements in CA | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110807 | 759 | | Introduction of Handover Requirements for Carrier Aggregation | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110793 | 760 | | E-UTRAN FDD Inter Frequency RSTD Measurement Accuracy test case | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110793 | 761 | | E-UTRAN TDD Inter Frequency RSTD Measurement Accuracy test case | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110786 | 765 | | Rearrangement of Time periods for EUTRA-UTRA reselection test case A.4.3.4.1 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110786 | 768 | | Removal of "Force to Cell 2" during initialisation for EUTRA - UTRA reselection test cases | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110807 | 776 | | Introduction of UE interruption requirements in SCC measurements with de-activated SCell | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110794 | 797 | | Editorial Correction to Cell Re-selection Requirements | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110789 | 808 | | Correction to side conditions for TDD inter-frequency CGI identification for Rel-10 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110786 | 814 | | Correction to inter-RAT cell identificiation time in DRX for Rel-10 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110787 | 817 | | Correction to identification time of UTRA FDD cell for SON in DRX for Rel-10 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110787 | 822 | | Correction to requirements of E-UTRAN TDDUTRAN TDD measurements for SON when DRX is used for Rel-10 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110807 | 829 | | Corrrection to the side condition for measurements for E- UTRA carrier aggregation | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110803 | 850 | | CR Timestamp accuracy requirements for MDT | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110812 | 778 | 1 | Add 2GHz S-Band (Band 23) in 36.133 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110796 | 787 | 1 | Clarification on inter-frequency layers for RSTD | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110794 | 780 | 1 | Correction to RSTD measurement for Rel-10 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110807 | 852 | 1 | Pcmax,c mapping | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110787 | 771 | 1 | Clarification of Radio link monitoring test requirements (The CR was not implemented as it is not based on the latest version of the specification) | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110807 | 793 | 1 | E-CID Measurement Requirements under Pcell Switching | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110807 | 775 | 1 | Removal of undefined intra-freq RSRQ relative accuracy requirements in CA | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110789 | 856 | | Correction on E-UTRAN FDD RSTD intra frequency case | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110796 | 800 | 1 | Addition of E-UTRAN FDD/TDD cdma2000 1xRTT measurements requirement for SON for Rel-10 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110790 | 804 | 1 | Addition of test cases for TDD intra-frequency SI reading using autonomous gaps with both non DRX and DRX for Rel-10 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110790 | 806 | 1 | Addition of test cases for TDD inter-frequency SI reading using autonomous gaps with both non DRX and DRX for Rel- | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110787 | 828 | 1 | Addition of missing EsNoc parameters in E-UTRAN TDD UTRAN TDD Measurements test cases for Rel-10 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110807 | 835 | 1 | Clarification of UE Rx-Tx time difference measurement requirement for carrier aggregation | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110804 | 859 | | Expanded 1900 MHz addition to 36.133 | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110811 | 860 | | Introduction of RLM requirement for eICIC | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110796 | 794 | 1 | E-CID Measurement Requirements under Handover | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110811 | 762 | 1 | CR on RLM requirements for eICIC | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110811 | 788 | 2 | RSRP and RSRQ measurement requirements for elCIC | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110811 | 851 | 1 | CR on RSRP and RSRQ measurement accuracy requirements for elCIC | 10.2.0 | 10.3.0 |
| 2011-06 | RP-52 | RP-110807 | 802 | 2 | Addition of OTDOA measurement requirement for E-UTRAN carrier aggregation | 10.2.0 | 10.3.0 |
| 2011-09 | RP-53 | RP-111246 | 863 | | Thresholds and margins for reporting of neighbour cells in RRM test A.8.9.1 | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111246 | 902 | ļ | Thresholds and margins for RRM tests A.5.2.1 and A.5.2.2 | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111246 | 905 | | Thresholds and margins for RRM tests A.5.2.4 and A.5.2.5 | 10.3.0 | 10.4.0 |
| 2011-09 2011-09 | RP-53 RP-53 | RP-111247 RP-111247 | 889 915 | | Removing [] in clause 8.1.2.2.2.2 for Rel-10 Adding condition of UTRA TDD measurement report delay | 10.3.0 | 10.4.0 |
| 0011 | DD 5- | DD :- | 000 | | requirements applied | 40.0- | 10.1. |
| 2011-09 | RP-53 RP-53 | RP-111247 RP-111251 | 930 926 | 1 | Clarify time points and time duration for RLM tests A.7.3.x Adding enhanced UTRA TDD cell identification requirements for Rel-10 | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111251 | 969 | | CR for E-UTRAN FDD GSM event triggered reporting in AWGN with enhanced BSIC identification in R10 | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111252 | 894 | | Requirements for RRC Connection Release with Redirection | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111252 | 960 | | Missing RSRQ in Intra-frequency measurement requirements | 10.3.0 | 10.4.0 |
| | | | | | | | |

| | | 1 | I | | for TDD in R10 | | |
|---------|----------------|------------------------|----------|---|--|--------|------------------|
| 2011-09 | RP-53 | RP-111255 | 946 | | Introduction of Band 22 | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111255 | 979 | 1 | Modifications of Band 42 and 43 | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 879 | 1 | Correction to RRC connection mobility control in CA | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 895 | 2 | RSTD Measurement Requirements under Handover | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 896 | 2 | RSTD Measurement Requirements under Pcell Switching | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 920 | 1 | Editorial corrections for 36.133 (Rel-10) | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 924 | 1 | Correction to RRC connection mobility control in CA | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 927 | | Modifications on TDD inter frequency measurements with autonomous gaps | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 945 | 1 | Frequency band related requirements to 36.133 | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 949 | 1 | Correction of references | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 950 | | Alignment of the carrier aggregation terminology | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 951 | | Band simplification for core requirements | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 952 | | Clarification in inter-frequency RSTD accuracy tests | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 953 | 1 | Editorial corrections for RRM requirements | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111263 | 961 | | Missing RSRQ in E-UTRA carrier aggregation measurement requirements | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111265 | 874 | 1 | Clarification of TDD uplink-downlink subframe configurations applicability for RSTD measurement in CA | 10.3.0 | 10.4.0 |
| 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 | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111265 | 883 | 1 | Alignment of terminology for SCell measurement cycle | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111265 | 921 | 1 | Introduction of Pcmax,c reporting requirements for carrier | 10.3.0 | 10.4.0 |
| | <u> </u> | | <u>L</u> | | aggregation | | |
| 2011-09 | RP-53 | RP-111266 | 849 | 3 | RSTD Accuracy Requirements for Carrier Aggregation | 10.3.0 | 10.4.0 |
| 2011-09 | RP-53 | RP-111266 | 898 | 1 | Introduction of power headroom reporting requirement for | 10.3.0 | 10.4.0 |
| | | | | | carrier aggregation | | |
| 2011-09 | RP-53 | RP-111308 | 891 | 1 | RSRP and RSRQ measurement requirements for elCIC | 10.3.0 | 10.4.0 |
| 2011-12 | RP-54 | RP-111681 | 982 | | Corrections of inter-frequency measurement accuracy RSRP and RSRQ test cases | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111682 | 984 | | Removing [] in CSFB requirement for Rel-10 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111693 | 985 | | Reference channel for RLM testing with elCIC | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111683 | 987 | | Clarification on RSTD test cases | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111690 | 988 | | RSRP Measurement performance Io corrections | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111686 | 989 | | RLM measurement requirements for eICIC | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111693 | 990 | | PDCCH/PCFICH transmission parameters for RLM | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111683 | 992 | | Clarification on PRS bandwidth | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111735 | 993 | | Missing RSRQ in intra-frequency measurement requirements for elClC | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111686 | 994 | 1 | Test case for TDD RSRQ Accuracy for Carrier Aggregation | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111686 | 995 | | Cell identification requirements without DRX | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111693 | 997 | 1 | Test case for cell identification with eICIC in E-UTRAN FDD | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111693 | 998 | 1 | Test case for cell identification with eICIC in E-UTRAN TDD | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111691 | 999 | 1 | Carrier aggregation RSRP measurement test case for TDD | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 RP-54 | RP-111690 RP-111690 | 1001 | | Test case for enhanced UTRA TDD cell identification for R10 Test case for RRC connection release redirection to UTRA | 10.4.0 | 10.5.0 10.5.0 |
| 2011-12 | | | | | TDD for R10 | 10.4.0 | |
| 2011-12 | RP-54 | RP-111735 | 1005 | | Clarification of the Successful Percentage for Measurement Performance Requirements | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111691 | 1007 | 2 | FDD Absolute and Relative RSRQ Accuracy test in CA | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111691 | 1011 | 1 | FDD absolute and relative RSRP accuracies test in CA | 10.4.0 | 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 | 10.4.0 | 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 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111735 | 1018 | 1 | E-UTRAN FDD RRC connection release with redirection to UTRAN TDD in R10 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111735 | 1021 | 1 | CR for Inter-RAT SI reading | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111687 | 1021 | | Addition of E-UTRAN FDD - TDD Inter frequency cell | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111687 | 1023 | | reselection test case Addtion of E-UTRAN TDD - FDD Inter frequency cell | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111687 | 1024 | | reselection test case Addtion of E-UTRAN FDD - TDD Inter frequency handover | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111687 | 1025 | | test case Addtion of E-UTRAN TDD - FDD Inter frequency handover | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111687 | 1026 | | test case Addtion of E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111687 | 1027 | 1 | asynchronous cells test case Addtion of E-UTRAN FDD-TDD Inter-frequency event | 10.4.0 | 10.5.0 |
| | 3. | 111 111001 | | - | triggered reporting under fading propagation conditions in asynchronous cells test case | 130 | . 3.0.0 |

| 2011-12 | RP-54 | RP-111687 | 1028 | | Addtion of E-UTRAN FDD - TDD inter frequency | 10.4.0 | 10.5.0 |
|---------|-------|-----------|------|---|---|--------|------------------|
| 0011 10 | DD 54 | DD 444004 | 4004 | | measurement accuracy test case | 40.40 | 40.50 |
| 2011-12 | RP-54 | RP-111681 | 1031 | | Correction for the identification time in DRX for UTRA TDD in R10 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111735 | 1032 | | Correction the side condition for SCH in R10 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111735 | 1033 | 1 | Correction to event triggered reporting for TS 36.133 in R10 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111681 | 1039 | 1 | Correction of E-UTRAN TDD-TDD inter frequency handover test case in R10 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111735 | 1041 | | Clarification of Expected RSTD and Expected RSTD uncertainty in RSTD test cases in R10 | 10.4.0 | 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 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111683 | 1046 | | Thresholds and margins for RRM tests A.8.11.5 and A.8.11.6 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111693 | 1047 | 2 | RLM Out of Sync Detection Test for eICIC | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111683 | 1049 | | RRC Connection Release with Redirection from E-UTRAN FDD to GERAN | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111693 | 1051 | | Colliding CRS in non-MBSFN ABS | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111683 | 1052 | | RRC Connection Release with Redirection from E-UTRAN TDD to GERAN | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111693 | 1053 | 1 | RLM In Sync Detection Test for FDD eICIC | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111693 | 1054 | 1 | RLM In Sync Detection Test for FDD eICIC | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111691 | 1055 | 1 | FDD Event triggered reporting on deactivated Scell in non- DRX | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111691 | 1056 | 1 | TDD Event triggered reporting on deactivated Scell in non- DRX | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111683 | 1058 | | Adding Band XX | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111690 | 1061 | 1 | Optional faster higher priority reselection | 10.4.0 | 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 | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111683 | 1066 | | Test cases for RRC connection release with redirection to UTRAN FDD | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111735 | 1072 | | CA definition alignment in test cases | 10.4.0 | 10.5.0 |
| 2011-12 | RP-54 | RP-111683 | 1074 | | Applicable PRS BW for RSTD accuracy requirements | 10.4.0 | 10.5.0 |
| 2012-03 | RP-55 | RP-120304 | 1077 | 1 | RSTD signalling modifications | 10.5.0 | 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 | 10.5.0 | 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 | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120291 | 1084 | | Thresholds and margins for E-UTRAN to C2K RRM reselection test cases (Rel-10) | 10.5.0 | 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 | 10.5.0 | 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 | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120293 | 1091 | | Addition of E-UTRAN TDD-HRPD Handover test case R10 | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120294 | 1093 | | Addition of E-UTRAN TDD-cdma2000 1X Handover test case R10 | 10.5.0 | 10.6.0 10.6.0 |
| 2012-03 | RP-55 | RP-120294 | 1099 | | Addition of E-UTRAN FDD-TDD inter frequency RSRQ measurement accuracy test case R10 | 10.5.0 | 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 elClC | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120304 | 1115 | | Io difference band-independent in Inter-frequency RSRP TDD TC A.9.1.4 | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120292 | 1118 | 1 | Thresholds and margins in RRM test case A.8.11.4 | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120292 | 1121 | | TDD PRACH Test cases value of PRACH Configuration Index and first preamble power | 10.5.0 | 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 | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120300 | 1134 | 1 | Clarification of colliding CRS in MBSFN ABS | 10.5.0 | 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 | 10.5.0 | 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 | 10.5.0 | 10.6.0 |
| | | | | | version of the spec | | |
| 2012-03 | RP-55 | RP-120304 | 1140 | | Core requirements for E-UTRAN TDD inter-RAT UTRAN FDD SI acquisition using autonomous gaps | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120304 | 1143 | 1 | Editorial corrections | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120300 | 1145 | 1 | Side condition clarification for eICIC with MBSFN | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120300 | 1146 | | Clarification on reported cells with elCIC | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120294 | 1148 | | Correction of RSTD accuracy test cases for TDD | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120300 | 1151 | 2 | RLM requirements with autonomous gaps | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120300 | 1152 | 1 | SNR levels in out-of-sync RLM test cases for elCIC | 10.5.0 | 10.6.0 |
| | | RP-120303 | | | CR for 36.133: B41 REFSENS and MOP changes to | | |

| | | | <u> </u> | ļ | accommodate single filter architecture | | |
|---------|-------|---------------|----------|---|--|--------|--------|
| 2012-03 | RP-55 | RP-120300 | 1157 | | eICIC measurement accuracy | 10.5.0 | 10.6.0 |
| 2012-03 | RP-55 | RP-120307 | 1154 | 1 | Introduction of Band 26/XXVI to TS 36.133 | 10.6.0 | 11.0.0 |
| 2012-06 | RP-56 | RP-120782 | 1162 | | Resolve Band 41 omission between R4-120125 and R4- 121106 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120770 | 1165 | 1 | Corrections to FDD-TDD Inter-freq RSRP measurement accuracy test case parameters | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120771 | 1168 | | OCNG and PDSCH for FDD-TDD event triggered reporting test cases | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120771 | 1171 | | RRC Connection Release with Redirection from E-UTRAN FDD to GERAN without System Information | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120771 | 1174 | | RRC Connection Release with Redirection from E-UTRAN TDD to GERAN without System Information | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1176 | | OCNG Patterns for MBSFN ABS | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120769 | 1183 | | Addition of E-UTRAN TDD-FDD Inter-frequency event | 11.0.0 | 11.1.0 |
| 20.2 00 | 55 | 1.1. 1.207.00 | | | 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 identification of a new CGI of E-UTRA cell using autonomous gaps test case R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120769 | 1189 | | Addition of E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120769 | 1192 | | Addition of E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test case R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120777 | 1195 | 1 | Addition of E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions test case R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120769 | 1198 | | Addition of E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions test case R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120770 | 1201 | | E-UTRA TDD RRC connection release redirection to UTRA FDD test without SI provided R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1205 | 1 | FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1207 | 1 | TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120780 | 1213 | | CR to TS36.133 Corrections on RRC signalling in RLM test cases for eICIC | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120773 | 1223 | | Test case for event-triggered reporting on deactivated SCell with PCell interruption | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120770 | 1227 | 1 | Finalization of Rel.9 cell reselection enhancement related test cases | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120770 | 1231 | | E-UTRAN FDD to UTRAN FDD RRC connection release with redirection test case when SI is not provided | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120781 | 1233 | | No interruptions on PCell at SCell activation/ deactivation when measCycleSCell is smaller than 640 ms | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120780 | 1235 | | Editorial corrections | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120782 | 1237 | 1 | Reporting criteria requirements for carrier aggregation | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1239 | | Cell identification requirements with DRX | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1241 | 1 | Phase II elCIC FDD: absolute and relative RSRP accuracies in non-MBSFN ABS | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1243 | 1 | Phase II eICIC TDD: absolute and relative RSRP accuracies in non-MBSFN ABS | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1249 | | RLM requirements with autonomous gaps for DRX | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120779 | 1251 | | CR for 36.133: Aligning RSRQ measurement requirements in TS 36.133 with TS 36.101 regarding the modification of B41 REFSENS | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120777 | 1260 | | Bands 22, 23, 42 and 43 side conditions for inter-frequency measurements with autonomous gaps | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120772 | 1261 | | Clarification on UE Rx-Tx with eICIC | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120767 | 1271 | | sr-ConfigIndex in TDD DRX test cases | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120782 | 1273 | 1 | Remove [] from elCIC RSRP, RSRQ Es/lot side conditions | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120764 | 1277 | 1 | RRM: Clarifications to the OCNG patterns | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1279 | 2 | Intra-Frequency FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1286 | 1 | elCIC FDD out-of-sync RLM test case in MBSFN ABS | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1288 | 1 | elCIC TDD out-of-sync RLM test case in MBSFN ABS | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120781 | 1289 | 1 | On UE behavior in the uplink subframe after measurement GAP | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120773 | 1293 | 1 | Clarification on the number of monitoring layers for CA UEs | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1299 | 2 | CR on TDD RSRQ test case under Time Domain Measurement Resource Restriction with MBSFN ABS Rel11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1303 | 1 | In-Sync RLM test case in MBSFN ABS for E-UTRAN FDD R11 | 11.0.0 | 11.1.0 |
| | 1 | 1 | 1 | 1 | 1 **** | 1 | 1 |

| 2012-06 | RP-56 | RP-120784 | 1306 | 1 | In-Sync RLM test case in MBSFN ABS for E-UTRAN TDD R11 | 11.0.0 | 11.1.0 |
|---------|-------|-----------|------|---|--|--------|--------|
| 2012-06 | RP-56 | RP-120781 | 1310 | | Inter-frequency and Inter-RAT Requirements for | 11.0.0 | 11.1.0 |
| 2042.00 | DD 50 | DD 400700 | 4040 | 4 | Measurements without Measurement Gaps | 44.0.0 | 44.4.0 |
| 2012-06 | RP-56 | RP-120788 | 1318 | 1 | The introduction of Multi-TA timing requirements R11 | 11.0.0 | 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 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120777 | 1322 | | Addition of E-UTRAN TDD RSTD measurement accuracy test case in carrier aggregation R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120779 | 1328 | | Correction to RLM requirements in elCIC with Autonomous gaps R11 | 11.0.0 | 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 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120770 | 1336 | | Correction to E-UTRAN TDD redirection to UTRAN FDD test configuration R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120780 | 1337 | 1 | FDD CA RSTD Measurement Reporting Delay Test Case (Rel-11) | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120782 | 1338 | 1 | TDD CA RSTD Measurement Reporting Delay Test Case (Rel-11) | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120779 | 1342 | | Correction to RSTD measurement reporting delay requirement in CA R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120795 | 1345 | 1 | Add Band 25 lo values R11 | 11.0.0 | 11.1.0 |
| | | | | | | | |
| 2012-06 | RP-56 | RP-120777 | 1347 | 1 | Clarification for cell identification condition in inter-RAT SI reading requirement R11 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120793 | 1349 | _ | Introduction of Band 28 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120794 | 1350 | 1 | Introduction of Band 44 | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120780 | 1355 | | Editorial corrections | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120766 | 1361 | 2 | Correction of a timer period in inter-frequency measurement tests | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120764 | 1363 | 1 | UL Transmit Timing Requirements | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1364 | 2 | Phase Ilbis eICIC FDD absolute and relative RSRP accuracy with MBSFN ABS | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1366 | 2 | Phase Ilbis eICIC TDD absolute and relative RSRP accuracy with MBSFN ABS | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120784 | 1368 | | OCNG correction in Phase I elCIC test cases | 11.0.0 | 11.1.0 |
| 2012-06 | RP-56 | RP-120792 | 1379 | | Introduction of e850_LB (Band 27) to TS 36.133 | 11.0.0 | 11.1.0 |
| 2012-09 | RP-57 | RP-121301 | 1385 | | Identification of Cell 3 in RRM Test cases A.4.2.7 and A.4.2.8 | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121301 | 1390 | | Making FDD-TDD Inter-freq RSRQ measurement accuracy | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121304 | 1392 | | test case band-agnostic Thresholds and margins in RRM test cases A.8.16.1 and | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121295 | 1398 | 1 | A.8.16.2 Modification of Handover Delay Requirement and Test Cases | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121302 | 1400 | 1 | from E-UTRAN to cdma2000 1x (Rel-11) | 11.1.0 | 11.2.0 |
| | | | | | Correction to RSRP/RSRQ measurement accuracy tests in MBSFN R11 | | |
| 2012-09 | RP-57 | RP-121304 | 1403 | | Activation/ deactivation core requirement for carrier aggregation R11 | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121313 | 1405 | | Minor corrections for E-UTRAN â€' GSM measurements without Measurement Gaps and Rx-Tx measurements when PCell is changed | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121304 | 1407 | 3 | RRM requirements for CA REFSENSE (Rel-11) | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121304 | 1409 | - | Square Bracket Removal for RSTD measurement | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121304 | 1411 | | requirement in Pcell changing and Handover R11 Correction to the E-UTRAN secondary component carrier | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121304 | 1411 | | measurements when common DRX is used R11 Requirements for Inter-frequency Measurements without | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121304 | 1415 | | Gaps when DRX is used R11 Clarification on TDD UL-DL subframe configurations in inter- | 11.1.0 | |
| | | | | | frequency RSTD measurement without gaps R11 Correction for E-UTRA TDD RRC connection release | | 11.2.0 |
| 2012-09 | RP-57 | RP-121301 | 1418 | | redirection to UTRA TDD test case R11 | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121340 | 1419 | | Addition of E-UTRAN FDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121340 | 1420 | | Addition of E-UTRAN TDD - UTRAN FDD identification of a new CGI of UTRAN cell using autonomous gaps | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121301 | 1423 | | Correction to E-UTRAN TDD-FDD Inter-frequency event triggered reporting test case R11 | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121302 | 1432 | | Alignment for ABS configurations in RRM Tests R11 | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121294 | 1433 | 1 | Correction to RSRQ accuracy test cases R11 | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121297 | 1438 | | Radio conditions for PBCH reading in E-UTRA | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121305 | 1444 | | Introduction of inter-frequency/ RAT measurements in CA | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121302 | 1449 | | ABS signal transmission configuration for RRM tests | 11.1.0 | 11.2.0 |
| 2012-09 | RP-57 | RP-121340 | 1450 | | Table format update for adding new bands | 11.1.0 | 11.2.0 |

| 2012-12 RP-58 RP-121891 1458 - Random Access requirements for SCell 11.2.0 1 2012-12 RP-58 RP-121891 1459 - Carrection on CA TDD RSTD measurement accuracy test cases R11 2.0 2.0 |
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| 2013-06 | RP-60 | RP-130765 | 1659 | 1 | RRM test configurations for 20MHz R11 | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130763 | 1668 | 1 | Corrections on RSTD measurement test cases (Rel-11) | 11.4.0 | 11.5.0 |
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| 2013-06 | RP-60 | RP-130761 | 1677 | | Cell 1 levels for RSRP Test cases A.9.1.3 and A.9.1.4 | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130765 | 1679 | 1 | RSRP, RSRQ RRM elCIC Test case cleanup | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130761 | 1683 | | Update on the GSM carrier RSSI measurement period when DRX is used | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130763 | 1692 | | sr-ConfigIndex in TDD-FDD Inter-frequency event triggered DRX Test case A.8.14.2 | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130767 | 1694 | | Testing of CA tests with multiple BW combinations | 11.4.0 | 11.5.0 |
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| 2013-06 | RP-60 | RP-130770 | 1700 | 1 | Removing an elCIC note on measurements | 11.4.0 | 11.5.0 |
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| 2013-06 | RP-60 | RP-130763 | 1716 | | Editorial corrections in RSTD requirements | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130766 | 1719 | | SCell Activation Delay Requirements in CA | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130765 | 1721 | | Clarification on supported bandwidth combinations in RSTD requirements with CA | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130770 | 1723 | 1 | Impact of REFSENS requirements on the core specification | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130770 | 1724 | | Correction of the total number of reporting criteria | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130769 | 1728 | 1 | Condition clarification in MDT requirements | 11.4.0 | 11.5.0 |
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| 2013-06 | RP-60 | RP-130763 | 1745 | | RRM: Adding required measurement gap | 11.4.0 | 11.5.0 |
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| 2013-06 | RP-60 | RP-130763 | 1752 | | GSM cell list size for Test Cases A.6.3.10, A.6.3.11 | 11.4.0 | 11.5.0 |
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| 2013-06 | RP-60 | RP-130770 | 1771 | 1 | In sync detection with CRS assistance information with non- MBSFN ABS in TDD | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130770 | 1772 | 1 | E-UTRAN FDD RLM Out-of-sync Test of FelCIC | 11.4.0 | 11.5.0 |
| 2013-06 2013-06 | RP-60 RP-60 | RP-130770 RP-130767 | 1773 1776 | 1 | E-UTRAN TDD RLM Out-of-sync Test of FeICIC E-UTRAN FDD absolute and relative RSRP accuracies for | 11.4.0 | 11.5.0 |
| | | | | | 20MHz in CA R11 | | 11.5.0 |
| 2013-06 | RP-60 | RP-130767 | 1778 | | E-UTRAN TDD absolute and relative RSRP accuracies for 20MHz in CA R11 | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130765 | 1780 | | Modification of OCNG patterns of RRM test configuration for 20MHz R11 | 11.4.0 | 11.5.0 |
| 2013-06 2013-06 | RP-60 RP-60 | RP-130761 RP-130767 | 1782 1784 | | Clarification of Pcell in 36.133 R11 FDD Absolute and relative RSRQ accuracies for CA with | 11.4.0 11.4.0 | 11.5.0 11.5.0 |
| 2013-06 | RP-60 | RP-130767 | 1786 | | 20MHz BW (Rel-11) TDD Absolute and relative RSRQ accuracies for CA with | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130761 | 1790 | | 20MHz BW (Rel-11) Correction on fading propagation condition for CA inter-RAT | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130770 | 1791 | | test cases R11 Clean up for band 44 | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130765 | 1793 | 1 | E-UTRAN TDD UE Rx-Tx time difference test case in elCIC | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130770 | 1799 | 1 | Test case for UE Transmit Timing Accuracy for SCell | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130767 | 1801 | | CR on measurements without gaps | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130770 | 1804 | 1 | Editorial corrections RRM | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130765 | 1806 | 1 | Clarification for UE Rx-Tx with elCIC | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130770 | 1807 | 2 | Capturing RF requirements in the core specification | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130765 | 1808 | 1 | Test case for UE Rx-Tx accuracy with eICIC in FDD | 11.4.0 | 11.5.0 |
| 2013-06 2013-06 | RP-60 RP-60 | RP-130770 RP-130765 | 1812 1814 | 1 | RSRP and RSRQ relative accuracy requirements for FelCIC Adding clarification for begin and end of measurement GAP for Rel-11 | 11.4.0 11.4.0 | 11.5.0 11.5.0 |
| 20.000 | | | 1 | | | | |

| 2013-06 | RP-60 | RP-130770 | 1822 | 1 | Clarification on antenna ports in the measured and aggressor | 11.4.0 | 11.5.0 |
|--------------------|----------------|------------------------|--------------|---|---|------------------|------------------|
| | | | | | cells with FelCIC | | |
| 2013-06 | RP-60 | RP-130770 | 1825 | 1 | UE Rx-Tx accuracy requirements with FeICIC | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130770 | 1826 | | UE Rx-Tx measurement requirements with FeICIC | 11.4.0 | 11.5.0 |
| 2013-06 | RP-60 | RP-130770 | 1827 | 2 | Test case for cell identification with FelCIC in FDD | 11.4.0 | 11.5.0 |
| 2013-06 2013-06 | RP-60 RP-60 | RP-130770 RP-130770 | 1828 1829 | 2 | Test case for cell identification with FeICIC in TDD Corrections on Wideband RSRQ inter-frequency accuracy | 11.4.0 11.4.0 | 11.5.0 11.5.0 |
| | | | | ı | requirements | | |
| 2013-06 | RP-60 | RP-130791 | 1769 | 1 | Introduction of Band 30 | 11.5.0 | 12.0.0 |
| 09-2013 | RP-61 | RP-131303 | 1830 | 1 | UTRAN FDD CPICH Ec/No measurement accuracy test for 5MHz bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131291 | 1832 | | Correction on the test cases for UE Transmit Timing | 12.0.0 | 12.1.0 |
| 00.0040 | DD 04 | DD 101000 | 1000 | | Accuracy for SCell (Rel-12) | 40.00 | 40.4.0 |
| 09-2013 | RP-61 | RP-131282 | 1836 | | Corrections on RSTD CA test parameters (Rel-12) | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1839 | | FDD: RSTD measurement reporting test cases for CA with 20MHz BW (Rel-12) | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1842 | | TDD: RSTD measurement reporting test cases for CA with 20MHz BW (Rel-12) | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131285 | 1844 | | Timing and RSRP value corrections in Test cases A.9.2.6 and A.9.2.9 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131285 | 1846 | | Corrections to Bands for 20MHz CA Test cases | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131279 | 1854 | | Cell time offset in TDD Inter-RAT test cases | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1855 | | EUTRA FDD-UTRA FDD cell reselection: UTRA FDD is of | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1860 | | lower priority Rel-12 CRs on synchronization requirements for E-UTRA to | 12.0.0 | 12.1.0 |
| | | | 1866 | 4 | CDMA 2000 handover | | |
| 09-2013 | RP-61 | RP-131290 | | 1 | Correct the SNR values for RLM tests with non-MBSFN ABS in FeICIC R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131290 | 1869 | 1 | E-UTRAN FDD RSRP Measurement Accuracy Test in FelCIC R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131290 | 1871 | 1 | E-UTRAN TDD RSRP Measurement Accuracy Test in FeICIC R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131284 | 1873 | | E-UTRAN FDD UE Rx-Tx Time difference test in FeICIC R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131284 | 1875 | | E-UTRAN TDD UE Rx-Tx Time difference test in FelCIC R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131284 | 1881 | | Clarification on UE Rx-Tx accuracy requirements in FelCIC R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131284 | 1883 | | Clarification on UE Rx-Tx measurement requirements in FeICIC R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1886 | | Clarification on antenna port for timing and eCID test cases R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1889 | 1 | Addition of TDD serving cell measurement accuracy tests R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1890 | | Introduction of Band 31 in 36.133 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1891 | | Addition of New OCNG Pattern for 5MHz | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1892 | | E-UTRAN FDD intra-frequency RSRP measurement accuracy for 5MHz bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1893 | | E-UTRAN FDD-FDD inter-frequency RSRP measurement | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1894 | | accuracy for 5MHz bandwidth E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync | 12.0.0 | 12.1.0 |
| | | | 4 | | for 5MHz Bandwidth | 15 - | |
| 09-2013 | RP-61 | RP-131303 | 1895 | | E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1896 | | asynchronous cells for 5MHz bandwidth E-UTRAN FDD-FDD intra-frequency Cell Re-selection case | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1897 | | for 5MHz bandwidth E-UTRAN FDD intra-frequency RRC re-establishment for | 12.0.0 | 12.1.0 |
| | | | | | 5MHz bandwidth | | |
| 09-2013 | RP-61 | RP-131303 | 1898 | | E-UTRAN FDD - Contention Based Random Access Test for 5MHz bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1899 | 1 | E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1900 | | E-UTRA FDD- UTRA FDD inter-RAT handover case for 5MHz bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1901 | 1 | E-UTRA FDD- UTRA FDD CPICH RSCP measurement accuracy issues | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131285 | 1903 | | Clarification of Refesens in WB-RSRQ sections of 36.133 R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131290 | 1905 | | Remove the brackets of FeICIC side conditions R12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1908 | 1 | Test cases of E-UTRAN FDD RSTD Measurement Accuracy | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1913 | 1 | for Carrier Aggregation for 20MHz R12 Test cases of E-UTRAN TDD RSTD Measurement Accuracy | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131284 | 1916 | | for Carrier Aggregation for 20MHz R12 Correction to SCH Es/lot side condition for intra-frequency | 12.0.0 | 12.1.0 |
| | | | | | measurements under time domain measurement resource | |] |

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|--------------------|----------------|------------------------|--------------|---|---|------------------|------------------|
| 09-2013 | RP-61 | RP-131303 | 1919 | | E-UTRAN FDD " Non-contention Based Random Access Test for 5MHz bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1921 | | Modification on the requirement for PCell interruption for Rel- 12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1922 | | E-UTRAN FDD " Timing Advance Accuracy Test for 5MHz bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1928 | | Phase II CA 20 MHz Tests: Event triggered reporting on deactivating SCell and and interruption probability without DRX | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1945 | 1 | CR on Applicability of 5MHz Test Cases | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1946 | 1 | E-UTRAN FDD Radio Link Monitoring Test for In-Sync for 5MHz | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1947 | | E-UTRAN FDD Intra-frequency handover test for 5MHz Channel Bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1948 | | E-UTRAN FDD Intra-frequency RSRQ Accuracy Test for 5MHz Channel Bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131293 | 1952 | | Editorial corrections RRM | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1954 | | E-UTRAN FDD Inter-frequency RSRQ Accuracy Test for 5MHz Channel Bandwidth | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131293 | 1955 | | Clarification of CGI reading requirements | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1958 | 2 | E-UTRAN FDD Radio Link Monitoring Test for In-Sync for 5MHz with DRX | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131285 | 1961 | | Editorial corrections in capturing RF requirements | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131282 | 1964 | | Clarification on tests for multiple bandwidths | 12.0.0 | 12.1.0 |
| 09-2013 09-2013 | RP-61 RP-61 | RP-131282 RP-131283 | 1969 1970 | | CR on PCell interrutptions Time stamp accuracy for RLF and handover failure reporting | 12.0.0 12.0.0 | 12.1.0 12.1.0 |
| 00 2012 | DD 61 | DD 121202 | 1071 | | with eMDT | 12.0.0 | 12 1 0 |
| 09-2013 09-2013 | RP-61 RP-61 | RP-131303 RP-131303 | 1971 1972 | | Part II RRM tests: UE intra-frequency measurements with | 12.0.0 | 12.1.0 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1973 | | synchronous cells in DRX FDD Part II RRM tests: E-UTRAN FDD - UTRAN FDD event | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131284 | 1978 | | triggered reporting under fading propagation conditions Correction of cell identification test case with FelCIC | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131284 | 1984 | | RLM requirements correction | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131284 | 1988 | | Clarification on antenna ports in the measured and aggressor cells for UE Rx-Tx with FelCIC | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131290 | 1990 | | FeICIC FDD Test for In-sync With MBSFN ABS for Rel. 12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131290 | 1992 | | FelCIC TDD Test for In-sync With MBSFN ABS for Rel. 12 | 12.0.0 | 12.1.0 |
| 09-2013 | RP-61 | RP-131303 | 1993 | | Correction of the SNR value of Out of sync RLM test for 5MHz | 12.0.0 | 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) | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131928 | 2003 | | Corrections to CA Interruption Requirements | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131926 | 2009 | | CRS Es/lot for elCIC RSRP, RSRQ with MBSFN ABS Test Cases | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131941 | 2010 | | Correction to RSTD measurement accuracy side condition for Band 31 | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 RP-62 | RP-131928 RP-131928 | 2013 | | Amendment on SCell Activation Delay Requirements for other activation actions Amendment on SCell Activation Delay Requirements in case | 12.1.0 | 12.2.0 |
| | | | | | no RS for measurement | | 12.2.0 |
| 12-2013 | RP-62 | RP-131936 | 2019 | | Correction to the SNR values for RLM tests with MBSFN ABS in FelCIC R12 | 12.1.0 | 12.2.0 |
| 12-2013 12-2013 | RP-62 RP-62 | RP-131936 RP-131928 | 2023 | 1 | CR on PCell Interruptions For Inter-band CA During | 12.1.0 12.1.0 | 12.2.0 12.2.0 |
| 12-2013 | RP-62 | RP-131939 | 2039 | | Measurements Introduction of E-UTRAN TDD WB-RSRQ test case R12 | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131939 RP-131925 | 2039 | | Correction of Proximity Indication Test Case | 12.1.0 | 12.2.0 |
| 12 2010 | 11. 02 | 11. 101020 | 2077 | | Not implemented as it is not based on the latest version of the spec | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131939 | 2053 | | Clarifications for intra-band non-contiguous CA R12 | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131939 | 2058 | | Inter-frequency WB-RSRQ FDD test case | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131928 | 2071 | | Clarification on Pcell Interruption shall not occur before SF n+5 | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131925 | 2078 | | Correction in RSTD requirements | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131939 | 2080 | 4 | Editorial corrections RRM | 12.1.0 | 12.2.0 |
| 12-2013 12-2013 | RP-62 RP-62 | RP-131939 RP-131931 | 2084 | 1 | Band simplification Requirements clarification under different BWs in FelCIC | 12.1.0 12.1.0 | 12.2.0 12.2.0 |
| 12-2013 | RP-62 | RP-131931 | 2091 | | Correction in cell search FelCIC test cases | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131936 | 2097 | 1 | Correct ABS pattern for FelCIC for In-sync with MBSFN ABS for Rel. 12 | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131926 | 2104 | | Correction to Test cases A.9.2.9 and A.9.2.10 | 12.1.0 | 12.2.0 |
| 12-2013 | RP-62 | RP-131942 | 2106 | 1 | Bands applicability in RSRP, RSRQ FDD-FDD Inter frequency tests for 5MHz Bandwidth | 12.1.0 | 12.2.0 |
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| 12-2013 | 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0 | 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.3.0 12.3.0 |
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| FelCIC R12 | 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0 | 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.3.0 12.3.0 |
| 12-2013 RP-62 RP-131967 2129 Correction on RMC pattern for 5MHz UE Transmit Timing Accuracy Tests 12-2013 RP-62 RP-131928 2135 CSI Reporting in SCell Activation Requirements 12-2013 RP-62 RP-131927 2143 Editorial corrections RRM 12-2013 RP-62 RP-131939 2145 Applying band simplification 12-2013 RP-62 RP-131939 2151 Correction to MTA requirements 12-2013 RP-62 RP-131925 2155 Correction in RSTD test cases 12-2013 RP-62 RP-131931 2157 Correction to interference clarification in FelCIC requirements 03-2014 RP-63 RP-140389 2236 Band simplification clean up 03-2014 RP-63 RP-140368 2234 Missing condition in CGI identification requirements 03-2014 RP-63 RP-140368 2258 Alignment between interruption requirements for SCell 03-2014 RP-63 RP-140367 2263 Correction of Proximity Indication Test Case 03-2014 RP-63 RP-140380 2259 <td>12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0</td> <td>12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.3.0 12.3.0</td> | 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0 | 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.3.0 12.3.0 |
| 12-2013 RP-62 RP-131928 2135 CSI Reporting in SCell Activation Requirements 12-2013 RP-62 RP-131927 2143 Editorial corrections RRM 12-2013 RP-62 RP-131939 2145 Applying band simplification 12-2013 RP-62 RP-131939 2151 Correction to MTA requirements 12-2013 RP-62 RP-131925 2155 Correction in RSTD test cases 12-2013 RP-62 RP-131931 2157 Correction to interference clarification in FelCIC requirements 03-2014 RP-63 RP-140389 2236 Band simplification clean up 03-2014 RP-63 RP-140368 2234 Missing condition in CGI identification requirements 03-2014 RP-63 RP-140368 2224 CSI Reporting in SCell Activation Requirements for RSTD and mobillity measurements for SCell 03-2014 RP-63 RP-140367 2263 Correction of Proximity Indication Test Case 03-2014 RP-63 RP-140380 2259 Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth 03-2014 RP-63 R | 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0 | 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.3.0 12.3.0 |
| 12-2013 RP-62 RP-131927 2143 Editorial corrections RRM 12-2013 RP-62 RP-131939 2145 Applying band simplification 12-2013 RP-62 RP-131939 2151 Correction to MTA requirements 12-2013 RP-62 RP-131925 2155 Correction in RSTD test cases 12-2013 RP-62 RP-131931 2157 Correction to interference clarification in FelCIC requirements 03-2014 RP-63 RP-140389 2236 Band simplification clean up 03-2014 RP-63 RP-140368 2234 Missing condition in CGI identification requirements 03-2014 RP-63 RP-140368 2224 CSI Reporting in SCell Activation Requirements for RSTD and mobillity measurements for SCell 03-2014 RP-63 RP-140367 2263 Correction of Proximity Indication Test Case 03-2014 RP-63 RP-140380 2259 Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth 03-2014 RP-63 RP-140380 2260 Addition of new RMC for E-UTRA TDD with 5MHz bandwidth | 12.1.0 12.1.0 12.1.0 12.1.0 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0 | 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 12.3.0 12.3.0 |
| 12-2013 RP-62 RP-131939 2145 Applying band simplification 12-2013 RP-62 RP-131939 2151 Correction to MTA requirements 12-2013 RP-62 RP-131925 2155 Correction in RSTD test cases 12-2013 RP-62 RP-131931 2157 Correction to interference clarification in FelCIC requirements 03-2014 RP-63 RP-140389 2236 Band simplification clean up 03-2014 RP-63 RP-140368 2234 Missing condition in CGI identification requirements 03-2014 RP-63 RP-140368 2224 CSI Reporting in SCell Activation Requirements for RSTD and mobillity measurements for SCell 03-2014 RP-63 RP-140367 2263 Correction of Proximity Indication Test Case 03-2014 RP-63 RP-140380 2259 Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth 03-2014 RP-63 RP-140380 2260 Addition of new RMC for E-UTRA TDD with 5MHz bandwidth | 12.1.0 12.1.0 12.1.0 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0 | 12.2.0 12.2.0 12.2.0 12.2.0 12.3.0 12.3.0 |
| 12-2013 RP-62 RP-131939 2151 Correction to MTA requirements 12-2013 RP-62 RP-131925 2155 Correction in RSTD test cases 12-2013 RP-62 RP-131931 2157 Correction to interference clarification in FelCIC requirements 03-2014 RP-63 RP-140389 2236 Band simplification clean up 03-2014 RP-63 RP-140368 2234 Missing condition in CGI identification requirements 03-2014 RP-63 RP-140368 2224 CSI Reporting in SCell Activation Requirements 03-2014 RP-63 RP-140368 2258 Alignment between interruption requirements for RSTD and mobillity measurements for SCell 03-2014 RP-63 RP-140367 2263 Correction of Proximity Indication Test Case 03-2014 RP-63 RP-140380 2259 Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth 03-2014 RP-63 RP-140380 2260 Addition of new RMC for E-UTRA TDD with 5MHz bandwidth | 12.1.0 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0 12.2.0 | 12.2.0 12.2.0 12.2.0 12.3.0 12.3.0 |
| 12-2013 RP-62 RP-131925 2155 Correction in RSTD test cases 12-2013 RP-62 RP-131931 2157 Correction to interference clarification in FelCIC requirements 03-2014 RP-63 RP-140389 2236 Band simplification clean up 03-2014 RP-63 RP-140368 2234 Missing condition in CGI identification requirements 03-2014 RP-63 RP-140368 2224 CSI Reporting in SCell Activation Requirements 03-2014 RP-63 RP-140368 2258 Alignment between interruption requirements for RSTD and mobillity measurements for SCell 03-2014 RP-63 RP-140367 2263 Correction of Proximity Indication Test Case 03-2014 RP-63 RP-140380 2259 Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth 03-2014 RP-63 RP-140380 2260 Addition of new RMC for E-UTRA TDD with 5MHz bandwidth | 12.1.0 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0 | 12.2.0 12.2.0 12.3.0 12.3.0 |
| 12-2013 RP-62 RP-131931 2157 Correction to interference clarification in FelCIC requirements 03-2014 RP-63 RP-140389 2236 Band simplification clean up 03-2014 RP-63 RP-140368 2234 Missing condition in CGI identification requirements 03-2014 RP-63 RP-140368 2224 CSI Reporting in SCell Activation Requirements 03-2014 RP-63 RP-140368 2258 Alignment between interruption requirements for RSTD and mobillity measurements for SCell 03-2014 RP-63 RP-140367 2263 Correction of Proximity Indication Test Case 03-2014 RP-63 RP-140380 2259 Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth 03-2014 RP-63 RP-140380 2260 Addition of new RMC for E-UTRA TDD with 5MHz bandwidth | 12.1.0 12.2.0 12.2.0 12.2.0 12.2.0 | 12.2.0 12.3.0 12.3.0 |
| 03-2014 RP-63 RP-140389 2236 Band simplification clean up 03-2014 RP-63 RP-140368 2234 Missing condition in CGI identification requirements 03-2014 RP-63 RP-140368 2224 CSI Reporting in SCell Activation Requirements 03-2014 RP-63 RP-140368 2258 Alignment between interruption requirements for RSTD and mobillity measurements for SCell 03-2014 RP-63 RP-140367 2263 Correction of Proximity Indication Test Case 03-2014 RP-63 RP-140380 2259 Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth 03-2014 RP-63 RP-140380 2260 Addition of new RMC for E-UTRA TDD with 5MHz bandwidth | 12.2.0 12.2.0 12.2.0 12.2.0 | 12.3.0 12.3.0 |
| 03-2014RP-63RP-1403682234Missing condition in CGI identification requirements03-2014RP-63RP-1403682224CSI Reporting in SCell Activation Requirements03-2014RP-63RP-1403682258Alignment between interruption requirements for RSTD and mobillity measurements for SCell03-2014RP-63RP-1403672263Correction of Proximity Indication Test Case03-2014RP-63RP-1403802259Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth03-2014RP-63RP-1403802260Addition of new RMC for E-UTRA TDD with 5MHz bandwidth | 12.2.0 12.2.0 12.2.0 | 12.3.0 |
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| 03-2014RP-63RP-1403682224CSI Reporting in SCell Activation Requirements03-2014RP-63RP-1403682258Alignment between interruption requirements for RSTD and mobillity measurements for SCell03-2014RP-63RP-1403672263Correction of Proximity Indication Test Case03-2014RP-63RP-1403802259Addition of new OCNG pattern for E-UTRA TDD with 5MHz bandwidth03-2014RP-63RP-1403802260Addition of new RMC for E-UTRA TDD with 5MHz bandwidth | 12.2.0 | |
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| mobillity measurements for SCell | | 12.3.0 |
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| | | |
| 00 0044 DD 00 DD 440000 0004 Addition of OCNO nothern for EUTDA EDD with EMUL | 12.2.0 | 12.3.0 |
| 03-2014 RP-63 RP-140380 2261 Addition of OCNG pattern for E-UTRA FDD with 5MHz | 12.2.0 | 12.3.0 |
| bandwidth without MBSFN | | |
| 03-2014 RP-63 RP-140381 2169 Updates on test case A.9.1.17 FDD—FDD Inter frequency | 12.2.0 | 12.3.0 |
| case for 5MHz Bandwidth for R12 | | |
| 03-2014 RP-63 RP-140389 2170 Correction on the SNR values of in-sync RLM test for 5MHz | 12.2.0 | 12.3.0 |
| 03-2014 RP-63 RP-140371 2200 1 Clarification of BW applicability in Rx-Tx Time Difference | 12.2.0 | 12.3.0 |
| measurement R12 | 12.2.0 | 12.5.0 |
| 03-2014 RP-63 RP-140389 2182 Clarification on FDD reference measurement channels for 5 | 12.2.0 | 12.3.0 |
| 03-2014 RF-03 RF-140369 2162 Claimication on FDD reference measurement chainless for 3 | 12.2.0 | 12.3.0 |
| | 12.2.0 | 1220 |
| | | 12.3.0 |
| 03-2014 RP-63 RP-140367 2192 PRS_RA corrections | 12.2.0 | 12.3.0 |
| 06-2014 RP-64 RP-140650 2331 3 Introduction of test cases for 5MHz +5MHz : absolute and | 12.3.0 | 12.4.0 |
| relative RSRQ accuracies in CA for FDD and TDD | | |
| The CR was not implemented as it contained the wrong | | |
| content. | | |
| 06-2014 RP-64 RP-140743 2366 1 SCell activation and deactivation delay test case for known | 12.3.0 | 12.4.0 |
| SCell | | |
| 06-2014 RP-64 RP-140910 2312 Clarification on UE Transmit Timing Accuracy test cases in | 12.3.0 | 12.4.0 |
| DRX mode R12 | | |
| 06-2014 RP-64 RP-140910 2267 RRM: Clean-up of time offset between cells in RSTD tests | 12.3.0 | 12.4.0 |
| (Rel-12) | | |
| 06-2014 RP-64 RP-140910 2354 RSTD inter-frequency requirements applicability | 12.3.0 | 12.4.0 |
| 06-2014 RP-64 RP-140911 2382 RRM: Remove square brackets from eICIC RLM test | 12.3.0 | 12.4.0 |
| requirement (Rei-12) | | |
| 06-2014 RP-64 RP-140911 2379 Correction to periodicity of ABS pattern in eICIC RRM test | 12.3.0 | 12.4.0 |
| cases | | |
| 06-2014 RP-64 RP-140911 2315 Correction for OCNG pattern number in RRM tests R12 | 12.3.0 | 12.4.0 |
| 06-2014 RP-64 RP-140911 2302 Introduce the CGI reading requirements in CA R12 | 12.3.0 | 12.4.0 |
| 06-2014 RP-64 RP-140911 2362 Introduce the CGI reading requirements in CA K12 06-2014 RP-64 RP-140911 2360 1 Test case corrections for eICIC | 12.3.0 | 12.4.0 |
| | | |
| 06-2014 RP-64 RP-140911 2278 Removing DPCH for handover from E-UTRAN to UTRA TDD for Rel-12 | 12.3.0 | 12.4.0 |
| 06-2014 RP-64 RP-140911 2422 Clean up the correction on PDSCH allocation in PRS | 12.3.0 | 12.4.0 |
| 06-2014 RP-64 RP-140911 2422 Clean up the correction on PDSCH allocation in PRS subframe R12 | 12.3.0 | 12.4.0 |
| 06-2014 RP-64 RP-140911 2319 Clarification on E-UTRAN TDD - UE Timing Advance | 12.3.0 | 12.4.0 |
| Adjustment Accuracy Test R12 | 12.3.0 | 12.4.0 |
| | 1220 | 12.4.0 |
| 06-2014 RP-64 RP-140914 2416 Correction to PCI configuration conditions in FelCIC tests R12 | 12.3.0 | 12.4.0 |
| | 1000 | 12.4.0 |
| | 12.3.0 | 12.4.0 |
| test setup | 40.0.0 | 40.40 |
| 06-2014 RP-64 RP-140916 2307 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy | 12.3.0 | 12.4.0 |
| Test for Scell in sTAG | | 15 |
| 06-2014 RP-64 RP-140916 2340 1 Test case for RACH on SCell | 12.3.0 | 12.4.0 |
| | 12.3.0 | 12.4.0 |
| 06-2014 RP-64 RP-140916 2306 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy | | |
| Test for Scell in sTAG | 12.3.0 | 12.4.0 |
| | | 40.40 |
| Test for Scell in sTAG | 12.3.0 | 12.4.0 |
| Test for Scell in sTAG | 12.3.0 | 12.4.0 12.4.0 |
| Test for Scell in sTAG | 12.3.0 12.3.0 | 12.4.0 |
| Test for Scell in sTAG | 12.3.0 | |
| Test for Scell in sTAG | 12.3.0 12.3.0 12.3.0 | 12.4.0 12.4.0 |
| Test for Scell in sTAG | 12.3.0 12.3.0 | 12.4.0 |
| Test for Scell in sTAG | 12.3.0 12.3.0 12.3.0 | 12.4.0 12.4.0 12.4.0 |
| Test for Scell in sTAG | 12.3.0 12.3.0 12.3.0 | 12.4.0 12.4.0 |

| D6-2014 RP-64 RP-140923 2390 E-UTRAN TDD RSTD measurement accuracy in C | acies in CA 12.3.0 Acies in CA 12.3.0 Acies in CA 12.3.0 Acies in CA 12.3.0 ACIES IN CA 12.3.0 | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
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| D6-2014 RP-64 RP-140923 Z990 E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 10MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 5MHz +5MHz E-UTRAN FDD absolute and relative RSRP accurate for 5MHz +5MHz E-UTRAN FDD absolute and relative RSRP accurate for 5MHz +5MHz E-UTRAN FDD absolute and relative RSRP accurate for 5MHz +5MHz E-UTRAN FDD absolute and relative RSRP accurate for 5MHz +5MHz E-UTRAN FDD absolute and relative RSRP accurate for 5MHz +5MHz E-UTRAN FDD absolute and relative RSRP accurate for 5MHz +5MHz E-UTRAN FDD absolute and relative RSRP accurate for 5MHz+5MHz E-UTRAN FDD Event triggered reporting on deactive for 5MHz+5MHz E-UTRAN FDD Event triggered reporting on deactive for 5MHz+5MHz E-UTRAN FDD absolute and relative RSRP accurate for 5MHz+5MHz E-UTRAN FDD Event triggered reporting on deactive for 5MHz+5MHz E-UTRAN FDD Event triggered reporting on deactive for 5MHz+5MHz E-UTRAN FDD Event triggered reporting on deactive for 5MHz+5MHz E-UTRAN FDD Event triggered reporting on deactive for 5MHz+5MHz E-UTRAN FDD Event triggered reporting on deactive for 5MHz+5MHz E-UTRAN FDD Event triggered reporting on deactive for 5MHz+5MHz E-UTRAN FDD Event triggered reporting on deactive f | triggered and TDD RA event 12.3.0 vating RX for vating RX for accies in CA 12.3.0 activated 12.3.0 | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
| D6-2014 RP-64 RP-140923 Z291 E-UTRAN TDD absolute and relative RSRP accurate for 10MHz+5MHz Introduction of Band 32/XXXII D6-2014 RP-64 RP-140928 Z394 Introduction of Band 32/XXXII D1-2014 RP-64 RP-140928 Z396 Inter frequency measurement requirements for elM D6-2014 RP-64 RP-140937 Z412 Introduction of test cases for SMHz +5MHz : RSTE Measurement Accuracy in Carrier Aggregation for bandwidth D1-2014 RP-64 RP-140937 Z412 Introduction of test cases for SMHz +5MHz : RSTE Measurement Recuracies in CA for FDD and TDD D1-2014 RP-64 RP-140937 Z410 Introduction of test cases for SMHz +5MHz : RSTE Measurement Reporting Test Case Introduction of test cases for SMHz +5MHz : RSTE Measurement Reporting Test Case Introduction of test cases for SMHz +5MHz : EVENT reporting on deactivating Scells in non-DRX FDD Introduction of test cases for SMHz +5MHz : EVENT reporting on deactivating Scells in non-DRX FDD Introduction of test cases for SMHz +5MHz : EVENT reporting on deactivated SCell with PCell interruption in non-DRX Introduction of test cases for SMHz +5MHz : EVENT reporting on deactivated SCell with PCell interruption in non-DRX Introduction of test cases for SMHz +5MHz : EVENT reporting on deactivated SCell with PCell interruption probability (0.5%) without D 10MHz+5MHz E-UTRAN TDD Event triggered reporting on deactivated SCell with PCell interruption probability (0.5%) without D 10MHz+5MHz E-UTRAN TDD Event triggered reporting on deactivated SCell in non-DRX for 10MHz+5MHz E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10M | 12.3.0 1 | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
| D6-2014 RP-64 RP-140926 2339 | ### 12.3.0 gaps | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
| 06-2014 RP-64 RP-140928 2394 1 Introduce RRM measurement requirements for elM o6-2014 RP-64 RP-140930 2374 1 Inter frequency measurements using autonomous of 2396 1 Inter frequency measurements using autonomous of 2412 1 Introduction of test cases for 5MHz +5MHz : RSTD Measurement Accuracy in Carrier Aggregation for bandwidth 06-2014 RP-64 RP-140937 2412 1 Introduction of test cases for 5MHz +5MHz : RSTD Measurement Accuracy in Carrier Aggregation for bandwidth 06-2014 RP-64 RP-140937 2410 1 Introduction of test cases for 5MHz +5MHz : Both relative RSRP accuracies in CA for FDD and TDD Measurement Reporting Test Case 06-2014 RP-64 RP-140937 2332 2 Introduction of test cases for 5MHz +5MHz : Event reporting on deactivating Scells in non-DRX FDD a second reporting on deactivating Scells in non-DRX FDD a second reporting on deactivating Scells in non-DRX FDD a second reporting on deactivating Scell with PCell interruption in non-DRX 06-2014 RP-64 RP-140939 2385 E-UTRAN TDD absolute and relative RSRQ accurricy for 10MHz+5MHz 06-2014 RP-64 RP-140939 2386 E-UTRAN TDD Event triggered reporting on deactivation probability (0.5%) without D 10MHz+5MHz 06-2014 | ### 12.3.0 gaps | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
| 06-2014 RP-64 RP-140928 2396 1 Inter frequency measurements using autonomous 06-2014 RP-64 RP-140930 2374 1 RRM requirements for TDD-FDD CD 06-2014 RP-64 RP-140937 2412 1 Introduction of test cases for 5MHz +5MHz : RSTE Measurement Accuracy in Carrier Aggregation for bandwidth 06-2014 RP-64 RP-140937 2330 1 Introduction of test cases for 5MHz +5MHz : absol relative RSRP accuracies in CA for FDD and TDD introduction of test cases for 5MHz +5MHz : RSTE Measurement Reporting Test Case 06-2014 RP-64 RP-140937 2410 1 Introduction of test cases for 5MHz +5MHz : RSTE Measurement Reporting Test Case 06-2014 RP-64 RP-140937 2332 2 Introduction of test cases for 5MHz +5MHz : Event reporting on deactivating Scells in non-DRX FDD as deactivated Scell with PCell interruption in non-DRX 06-2014 RP-64 RP-140937 2415 1 Introduction of test cases for 5MHz +5MHz : Event reporting on deactivated Scell with PCell interruption in non-DRX for 10MHz +5MHz : E-UTT witing and activated Scell with PCell interruption in non-DRX 06-2014 RP-64 RP-140939 2385 E-UTRAN FDD absolute and relative RSRQ accuracy reporting in n | gaps 12.3.0 12.3.0 12.3.0 15 + 5MHz 12.3.0 | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
| 06-2014 RP-64 RP-140937 2412 1 RRM requirements for TDD-FDD CA 06-2014 RP-64 RP-140937 2412 1 Introduction of test cases for 5MHz + 5MHz : RSTD Measurement Accuracy in Carrier Aggregation for bandwidth 06-2014 RP-64 RP-140937 2330 1 Introduction of test cases for 5MHz + 5MHz : absol relative RSRP accuracies in CA for FDD and TDD Introduction of test cases for 5MHz + 5MHz : RSTD Measurement Reporting Test Case 06-2014 RP-64 RP-140937 2332 2 Introduction of test cases for 5MHz + 5MHz : Event reporting on deactivating Scells in non-DRX FDD a deactivating Scells in non-DRX FDD a scenario in non-DRX 06-2014 RP-64 RP-140937 2415 1 Introduction of test cases for 5MHz + 5MHz : Event reporting on deactivating Scells in non-DRX FDD a scenario in non-DRX FDD a deactivating Scells in non-DRX FDD a scenario in non-DRX FDD a scenario in non-DRX FDD a scenario in non-DRX FDD a scenario in non-DRX FDD a scenario in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140939 2386 E-UTRAN TDD Event triggered reporting on deactivation in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140939 2292 E-UTRAN TDD Event triggered reporting on deactivation in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-14093 | 12.3.0 1 | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
| 06-2014 RP-64 RP-140937 2412 1 Introduction of test cases for 5MHz +5MHz : RSTE Measurement Accuracy in Carrier Aggregation for bandwidth 06-2014 RP-64 RP-140937 2330 1 Introduction of test cases for 5MHz +5MHz : absoling relative RSRP accuracies in CA for FDD and TDD 06-2014 RP-64 RP-140937 2410 1 Introduction of test cases for 5MHz +5MHz : RSTE Measurement Reporting Test Case 06-2014 RP-64 RP-140937 2332 2 Introduction of test cases for 5MHz +5MHz : Event reporting on deactivating Scells in non-DRX introduction of test cases for 5MHz +5MHz : E-UTI triggered reporting on deactivating Scells in non-DRX 06-2014 RP-64 RP-140937 2415 1 Introduction of test cases for 5MHz +5MHz : E-UTI triggered reporting on deactivating Scells in non-DRX 06-2014 RP-64 RP-140939 2294 E-UTRAN TDD absolute and relative RSRQ accurate for 10MHz+5MHz 06-2014 RP-64 RP-140939 2385 E-UTRAN FDD Event triggered reporting on deactivate scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2289 E-UTRAN FDD absolute and relative RSRQ accurate for 5MTz+10MHz 06-2014 RP-64 </td <td>12.3.0 5 + 5MHz 12.3.0</td> <td>12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0</td> | 12.3.0 5 + 5MHz 12.3.0 | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
| Measurement Accuracy in Carrier Aggregation for bandwidth | 5 + 5MHz ute and 12.3.0 12.3.0 triggered 12.3.0 RA event 12.3.0 acies in CA 12.3.0 vating RX for 12.3.0 vating RX for 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
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| 06-2014 RP-64 RP-140937 2410 1 Introduction of test cases for 5MHz +5MHz : RSTE Measurement Reporting Test Case 06-2014 RP-64 RP-140937 2332 2 Introduction of test cases for 5MHz +5MHz : Event reporting on deactivating Scells in non-DRX FDD at the reporting on deactivating Scells in non-DRX FDD at the reporting on deactivated SCell with PCell interruption in non-DRX 06-2014 RP-64 RP-140939 2294 E-UTRAN TDD absolute and relative RSRQ accurates for 10MHz+5MHz 06-2014 RP-64 RP-140939 2385 E-UTRAN TDD Event triggered reporting on deactive Scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2386 E-UTRAN TDD Event triggered reporting on deactive Scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2292 E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140939 2289 E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140945 2384 E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140945 2384 | triggered and TDD RA event 12.3.0 reacies in CA 12. | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
| 06-2014 RP-64 RP-140937 2332 2 Introduction of test cases for 5MHz +5MHz : Event reporting on deactivating Scells in non-DRX FDD at Introduction of test cases for 5MHz +5MHz : E-UTI 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 accuration for 10MHz+5MHz 06-2014 RP-64 RP-140939 2385 E-UTRAN TDD Event triggered reporting on deacting Scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2386 E-UTRAN TDD Event triggered reporting on deacting Scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2292 E-UTRAN TDD Event triggered reporting on deacting Scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2289 E-UTRAN TDD absolute and relative RSRQ accurations for 5MHz+10MHz 06-2014 RP-64 RP-140939 2289 E-UTRAN TDD Event triggered reporting under descell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140945 2384 Correct Correlation Matrix and Antenna Configuration RRM test cases A.8 06-2014 RP-64 RP-140945 2383 | and TDD RA event 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 acies in CA 12.3.0 activated 12.3.0 activated 12.3.0 | 12.4.0 12.4.0 12.4.0 12.4.0 12.4.0 |
| 06-2014 RP-64 RP-140937 2415 1 Introduction of test cases for 5MHz +5MHz : E-UTI 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 accuration for 10MHz+5MHz 06-2014 RP-64 RP-140939 2385 E-UTRAN FDD Event triggered reporting on deacting Scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2386 E-UTRAN TDD Event triggered reporting on deacting Scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2292 E-UTRAN FDD absolute and relative RSRQ accurations for 5MHz+10MHz 06-2014 RP-64 RP-140939 2289 E-UTRAN TDD Event triggered reporting under descell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140939 2288 E-UTRAN FDD Event triggered reporting under descell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140945 2384 E-UTRAN TDD - UE Transmit Timing Accuracy Tescell in sTAG 06-2014 RP-64 RP-140945 2346 1 E-UTRAN TDD - UE Transmit Timing Accuracy Tescell in sTAG 06-2014 RP-64< | RA event 12.3.0 acies in CA 12.3.0 ivating 12.3.0 ivating 12.3.0 ivating 12.3.0 ivating 12.3.0 acies in CA 12.3.0 activated 12.3.0 activated 12.3.0 activated 12.3.0 | 12.4.0 12.4.0 12.4.0 12.4.0 |
| 06-2014 RP-64 RP-140939 2294 E-UTRAN TDD absolute and relative RSRQ accurator for 10MHz+5MHz 06-2014 RP-64 RP-140939 2385 E-UTRAN FDD Event triggered reporting on deacting Scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2386 E-UTRAN TDD Event triggered reporting on deacting Scells and interruption probability (0.5%) without D 10MHz+5MHz 06-2014 RP-64 RP-140939 2292 E-UTRAN FDD absolute and relative RSRQ accuration for 5MHz+10MHz 06-2014 RP-64 RP-140939 2289 E-UTRAN TDD Event triggered reporting under deacting scell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140939 2288 E-UTRAN FDD Event triggered reporting under deacting scell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140945 2384 Correct Correlation Matrix and Antenna Configurating RM test cases A.8 06-2014 RP-64 RP-140945 2383 Correct Correlation Matrix and Antenna Configurating RM test cases A.4, A.7 06-2014 RP-64 RP-140945 236 2 New Test Case for UE Transmit Timing Accuracy requirements in DRX 06-2014 RP-64 RP-140945 | ivating RX for 12.3.0 RX for 1 | 12.4.0 12.4.0 12.4.0 12.4.0 |
| Scells and interruption probability (0.5%) without D 10MHz+5MHz 6-2014 RP-64 RP-140939 2386 E-UTRAN TDD Event triggered reporting on deacti Scells and interruption probability (0.5%) without D 10MHz+5MHz 6-2014 RP-64 RP-140939 2292 E-UTRAN FDD absolute and relative RSRQ accurates for 5MHz+10MHz 6-2014 RP-64 RP-140939 2289 E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz 6-2014 RP-64 RP-140939 2288 E-UTRAN FDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz 6-2014 RP-64 RP-140945 2384 Correct Correlation Matrix and Antenna Configurates RRM test cases A.8 6-2014 RP-64 RP-140945 2383 Correct Correlation Matrix and Antenna Configurates RRM test cases A.4, A.7 6-2014 RP-64 RP-140945 2336 2 New Test Case for UE Transmit Timing Accuracy requirements in DRX 6-2014 RP-64 RP-140945 2368 1 UE Behaviour after Measurement Gap | ivating 12.3.0 PRX for acies in CA 12.3.0 activated 12.3.0 activated 12.3.0 | 12.4.0 12.4.0 12.4.0 |
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| 06-2014 RP-64 RP-140939 2292 E-UTRAN FDD absolute and relative RSRQ accurrence for 5MHz+10MHz 06-2014 RP-64 RP-140939 2289 E-UTRAN TDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140939 2288 E-UTRAN FDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz 06-2014 RP-64 RP-140945 2384 Correct Correlation Matrix and Antenna Configurat RRM test cases A.8 06-2014 RP-64 RP-140945 2346 1 E-UTRAN TDD - UE Transmit Timing Accuracy Te SCell in sTAG 06-2014 RP-64 RP-140945 2383 Correct Correlation Matrix and Antenna Configurat RRM test cases A.4, A.7 06-2014 RP-64 RP-140945 2336 2 New Test Case for UE Transmit Timing Accuracy requirements in DRX 06-2014 RP-64 RP-140945 2268 1 UE Behaviour after Measurement Gap | activated 12.3.0 activated 12.3.0 | 12.4.0 |
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| 06-2014RP-64RP-1409392288E-UTRAN FDD Event triggered reporting under de Scell in non-DRX for 10MHz+5MHz06-2014RP-64RP-1409452384Correct Correlation Matrix and Antenna Configurat RRM test cases A.806-2014RP-64RP-14094523461E-UTRAN TDD - UE Transmit Timing Accuracy Te SCell in sTAG06-2014RP-64RP-1409452383Correct Correlation Matrix and Antenna Configurat RRM test cases A.4, A.706-2014RP-64RP-14094523362New Test Case for UE Transmit Timing Accuracy requirements in DRX06-2014RP-64RP-14094522681UE Behaviour after Measurement Gap | | |
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| 06-2014RP-64RP-1409452383Correct Correlation Matrix and Antenna Configurat RRM test cases A.4, A.706-2014RP-64RP-14094523362New Test Case for UE Transmit Timing Accuracy requirements in DRX06-2014RP-64RP-14094522681UE Behaviour after Measurement Gap | sts for 12.3.0 | 12.4.0 |
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| | 12.3.0 | 12.4.0 |
| | 12.3.0 | 12.4.0 |
| SCell in sTAG | sts for 12.3.0 | 12.4.0 |
| 06-2014 RP-64 RP-140945 2419 Editorial correction for band 31 in 36.133 | 12.3.0 | 12.4.0 |
| 06-2014 RP-64 RP-140959 2395 2 Introduce RSRP/RSRQ measurement accuracy refor 3DL CA | | 12.4.0 |
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| 09-2014 RP-65 RP-141526 2527 Tolerance levels for measurements on UTRAN | 12.4.0 | 12.5.0 |
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| 09-2014 RP-65 RP-141554 2495 Requirements for UE Measurements Procedures in RRC_CONNECTED State for 3DL CA | | 12.5.0 |
| 09-2014 RP-65 RP-141562 2454 1 Correction of values in RSTD tests | | 12.5.0 |
| 09-2014 RP-65 RP-141562 2457 Correction to RSTD CA Reporting Delay tests | 1240 | 12.5.0 |
| 09-2014 RP-65 RP-141562 2480 1 Clarification on UE bahavior considering max trans | 12.4.0 | |
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| 09-2014 RP-65 RP-141562 2496 1 Applicability of requirements | 12.4.0 | 12.5.0 12.5.0 |

| 09-2014 | RP-65 | RP-141562 | 2510 | | Note to clarify that certain requirements do not apply to band 32 | 12.4.0 | 12.5.0 |
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| 09-2014 | RP-65 | RP-141700 | 2471 | 3 | Clarification for ACK/NACK feedback of CGI measurement | 12.4.0 | 12.5.0 |
| 12-2014 | RP-66 | RP-142176 | 2484 | 2 | Introducing measurement accuracy requirements for UE category 0 in TS36.133 Clause 9 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142176 | 2506 | 3 | Measurements requirements for UE category 0 with 1 Rx | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142143 | 2534 | - | Correction of PRS Signal Levels in RSTD Reporting Tests | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142144 | 2538 | - | Correction of Es/Noc values in inter-frequency RSTD tests | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142174 | 2547 | 1 | Introduction of PDSCH FRC for TDD UL-DL configuration 0 | 12.5.0 | 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 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142174 | 2555 | 1 | CR on inter frequency RSRP test case for elMTA | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142174 | 2556 | 1 | CR on inter frequency RSRQ test case for eIMTA | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142147 | 2566 | - | Correction to ABS pattern and CRS Es/lot in felCIC RRM test cases | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142144 | 2569 | - | SCell activation and deactivation delay test case for unknown SCell R12 | 12.5.0 | 12.6.0 |
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| 12-2014 | RP-66 | RP-142177 | 2585 | 1 | RSRQ accuracy test case in TDD-FDD CA when Pcell is | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142177 | 2586 | 1 | FDD R12 RSRQ accuracy test case in TDD-FDD CA when Pcell is | 12.5.0 | 12.6.0 |
| | | | | | TDD R12 | | |
| 12-2014 | RP-66 | RP-142147 | 2597 | _ | Correction on lo value in CA 20MHz RSRQ test case R12 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142163 | 2598 | - | Correction on Io value in CA 10MHz+5MHz RSRQ test case R12 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142188 | 2599 | - | Range increase for RSRQ | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142188 | 2606 | 1 | Clarification of parallel reporting criteria (E-UTRA) | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142164 | 2611 | 1 | Interruptions with RSTD Measurements for 3DL CA | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142164 | 2614 | - | RRM requirements for RSTD in 3 DL CA | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142177 | 2619 | 1 | RSRP accuracy test cases for TDD-FDD CA | 12.5.0 | 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 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142144 | 2639 | - | Changes to RSTD CA Reporting Delay tests | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142188 | 2640 | - | Revision of RSRP absolute accuracy requirements in Rel-12 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142144 | 2644 | - | Clarifications to RSTD values | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142144 | 2656 | - | Correction to RSTD Intra Frequency Delay Test Case | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142144 | 2665 | - | Correction on autonomous time adjustment in MTAG case | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142176 | 2666 | - | Introduce RLM requirements for LC-MTC in TS36.133 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142174 | 2669 | 1 | Introducing test case for TDD-TDD Inter-frequency event triggered reporting for TDD UL/DL configuration 0 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142179 | 2670 | 1 | Introducing requirements for small cell enhancement in TS36.133 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142180 | 2671 | 2 | Introducing interruption requirements for dual connectivity into TS36.133 | 12.5.0 | 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 | 12.5.0 | 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 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142162 | 2676 | - | E-UTRAN TDD RSTD Measurement Reporting Test Case for 20MHz+10MHz | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142162 | 2677 | - | TDD RSRP for E-UTRAN Carrier Aggregation for | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142162 | 2678 | 1 | 20MHz+10MHz TDD RSRP for E-UTRAN Carrier Aggregation for | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142162 | 2679 | - | 20MHz+10MHz E-UTRAN TDD RSTD Measurement Accuracy in Carrier | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142143 | 2682 | 1 | Aggregation for 20MHz+10MHz Introducing positioning enhancement requirement for UE Rx- | 12.5.0 | 12.6.0 |
| 40.00:: | DD 65 | DD 440111 | 0000 | | Tx accuracy | 40.5.5 | 40.0.5 |
| 12-2014 12-2014 | RP-66 RP-66 | RP-142144 RP-142188 | 2686 2687 | - | Correction on CA test cases in R12 Correction on E-UTRAN TDD – Non-Contention Based | 12.5.0 12.5.0 | 12.6.0 12.6.0 |
| 12-2014 | RP-66 | RP-142179 | 2688 | 1 | Random Access Test For Scell Introduction of RSRP measurement accuracy requirement for | 12.5.0 | 12.6.0 |
| | | | | | DRS based measurement | | |
| 12-2014 | RP-66 | RP-142188 | 2690 | 1 | Ecat clarification for iRAT | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142180 | 2694 | - | CR for TS36.133 on Cell phase accuracy for Dual Connectivity | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142180 | 2695 | 1 | Introduction of RRM requirements for Dual Connectivity | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142180 | 2696 | 1 | Introduction of measurement requirements for Dual Connectivity | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142178 | 2697 | 1 | Measurement and reporting of BLER in section 9 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142177 | 2698 | 1 | Introduction of TDD-FDD CA test cases | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142178 | 2699 | 1 | CR on measurement for MBSFN MDT | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142188 | 2707 | 1 | PCell Interruption in Rel-12 CA | 12.5.0 | 12.6.0 |

| 12-2014 | RP-66 | RP-142158 | 2708 | 1 | UE Behaviour after Measurement Gap in CA | 12.5.0 | 12.6.0 |
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| 12-2014 | RP-66 | RP-142177 | 2709 | 1 | CA RRM Testing for Multiple Duplex Modes | 12.5.0 | 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 | 12.5.0 12.5.0 | 12.6.0 12.6.0 |
| 12-2014 | RP-66 | RP-142172 | 2714 | 1 | requierments Requirements for increased carrier monitoring for idle mode | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142172 | 2715 | 1 | 36.133 Requirements for increased carrier monitoring in RRC | 12.5.0 | 12.6.0 |
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| 12-2014 | RP-66 | RP-142161 | 2716 | 1 | Different TDD configurations in CA | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142178 | 2722 | 1 | MBMS requirements in section 9 | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142179 | 2725 | 1 | Intra-frequency and inter-frequency measurement accuracy requirements with DMTC | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142188 | 2727 | - | RSTD accuracy requirements for smaller and larger bandwidths | 12.5.0 | 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 | 12.5.0 | 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 CRS Assistance Information | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142149 | 2740 | - | Test case for inter-RAT HO to multicarrier UTRA | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142178 | 2741 | - | CR on parallel reporting criteria for eMBMS | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142186 | 2742 | - | Introduction of 2UL non-contiguous intra-band CA | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142021 | 2743 2745 | - | Introduction of 2UL inter-band CA | 12.5.0 | 12.6.0 |
| 12-2014 | RP-66 | RP-142150 | | - | Requirements for multicarrier handover from EUTRA to UTRA | 12.5.0 | 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 | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150382 | 2750 | - | Remove incorrect note from CA RSTD Accuracy tests | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150387 | 2751 | - | Change Nprs value for 5MHz CA RSTD Accuracy tests | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150066 | 2754 | 1 | Maximum allowed layers for multiple monitoring for CA | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150387 | 2756 | - | DRX correction for interruption with dual connectivity | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150388 | 2757 | - | Correction of Interruptions with RSTD Measurements for 3DL CA | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150387 | 2761 | 1 | RRM requirements for ProSe | 12.6.0 | 12.7.0 |
| 03-2015 03-2015 | RP-77 RP-77 | RP-150396 RP-150394 | 2763 2764 | 1 | Updating the requirements applicability for TDD config 0 Cleanup for RSRQ measurement requirement for SCE | 12.6.0 12.6.0 | 12.7.0 12.7.0 |
| 03-2015 | RP-77 | RP-150394 | 2774 | 1 | Clean up the correction on discovery signal measurements | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150387 | 2775 | 1 | Correction on MBSFN measurements | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150394 | 2776 | - | Introduce CA measurement accuracy requirements for SCE | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150382 | 2777 | - | Correction on lo in carrier aggregation test cases | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150387 | 2783 | - | Introducing accuracy requirement for new RSRQ | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150384 | 2785 | - | Time-domain measurement resource restriction pattern for serving cell in felCIC RSRP and RSRQ test cases | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150384 | 2791 | - | CR on typo of referencing section name in CA measurements | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150393 | 2797 | 1 | Clarification including PSCell in Note 1 for Ecat | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150386 | 2798 | 1 | Clarification of IncMon requirements for E-UTRA idle state | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150386 | 2799 | 1 | Clarification of IncMon requirements for E-UTRA connected state | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150386 | 2800 | 1 | Clarification concerning IncMon scaling for non-gap-assisted measurements | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150382 | 2803 | - | Correction of RMC and OCNG pattern in event triggered tests without measurement gap | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150394 | 2804 | - | CR on RSRQ requirements for CRS based discovery signal | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150387 | 2808 | - | Correction to RRM test cases | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150388 | 2809 | - | Correction to CA Testing with Different CA Configurations | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150393 | 2811 | - | Principle to test synchronous and asynchronous DC requirements | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150387 | 2814 | - | Further revision of RSRP requirement for 36.133 release 12 | 12.6.0 | 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 | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150387 | 2816 | 1 | High Doppler measurement accuracy requirements | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150384 | 2817 | 1 | 36.133 CR to change CPICH Ec/No to CPICH Ec/Io in EUTRA FDD to UTRA FDD HO test cases | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150388 | 2822 | - | Maximum Transmission Timing Difference in 3DL CA | 12.6.0 | 12.7.0 |
| 03-2015 | RP-77 | RP-150053 | 2824 | - | Correction to the implementation of CR 2471r3 (Clarification for ACK/NACK feedback of CGI measurement) | 12.6.0 | 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 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2828 | | RMC for 10 MHz for UE category 0 RRM tests | 12.7.0 | 12.8.0 |

| 06-2015 | RP-68 | RP-150957 | 2829 | | Correction to measurement scaling factor for incmon | 12.7.0 | 12.8.0 |
|---------|-------|-----------|------------|---|--|--------|--------|
| 06-2015 | RP-68 | RP-150957 | 2832 | | RSRP requierment for SCE | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2833 r1 | 1 | CR on FDD-FDD inter-frequency absolute and relative CRS RSRP accuracy test case | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2834 r1 | 1 | CR on TDD-TDD inter-frequency absolute and relative CRS RSRP accuracy test case | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2835 r1 | 1 | CR on FDD absolute and relative CSI-RSRP accuracy test case for E-UTRAN Carrier Aggregation | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2836 r1 | 1 | CR on TDD absolute and relative CSI-RSRP accuracy test case for E-UTRAN Carrier Aggregation | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2837 r1 | 1 | CR on FDD-FDD inter-frequency absolute and relative CSI- RSRP accuracy test case | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2838 r1 | 1 | CR on TDD-TDD inter-frequency absolute and relative CSI- RSRP accuracy test case | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2839 r1 | 1 | CR on FDD intra frequency absolute and relative CSI-RSRP accuracy test case | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2840 r1 | 1 | CR on TDD intra frequency absolute and relative CSI-RSRP accuracy test case | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2842 r1 | 1 | Intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2843 r1 | 1 | Absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2845 r1 | 1 | SCE FDD intra-frequency absolute RSRQ accuracy | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2846 r1 | 1 | SCE TDD intra-frequency absolute RSRQ accuracy | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2847 | | SCE FDD absolute RSRQ accuracy for CA | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2848 | | SCE TDD absolute RSRQ accuracy for CA | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2849 r1 | 1 | Test for CGI acqusition requirements for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2850 r1 | 1 | Test for cell identification for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2851 | | Test for handover requirements for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2852 | | Test for RRC re-establishment requirements for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2853 r1 | 1 | HD-FDD handover requirements for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150957 | 2855 r1 | 1 | Correction of requirements for ProSe in DRX | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2857 r1 | 1 | E-UTRAN FDD intra frequency CRS based discovery signal measurements when DRX is used | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2858 r1 | 1 | E-UTRAN TDD intra frequency CRS based discovery signal measurements when DRX is used | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2859 r1 | 1 | E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2860 r1 | 1 | E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2861 r1 | 1 | E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2862 r1 | 1 | E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2866 r1 | 1 | RSRP accuracy FD-FDD Intra frequency case for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2867 r1 | 1 | RSRP accuracy HD-FDD Intra frequency case for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2868 r1 | 1 | RSRP accuracy TDD Intra frequency case for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2869 r1 | 1 | RSRQ accuracy FD-FDD Intra frequency case for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2870 r1 | 1 | RSRQ accuracy HD-FDD Intra frequency case for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2871 r1 | 1 | RSRQ accuracy TDD Intra frequency case for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | 2872 r1 | 1 | Test case for 3DL CA: PCell in FDD: Event triggered reporting on deactivated SCells and interruption probability (0.5%) without DRX (TDD-FDD CA) | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | 2873 r1 | 1 | Test case for 3DL CA: PCell in TDD: Event triggered reporting on deactivated SCells and interruption probability (0.5%) without DRX (TDD-FDD CA) | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150958 | 2874 r1 | 1 | Test case for 3DL CA: Event triggered reporting on deactivated SCells and interruption probability (0.5%) without DRX (FDD CA) | 12.7.0 | 12.8.0 |

| 06-2015 | RP-68 | RP-150968 | 2875 r1 | 1 | Test case for 3DL CA: Event triggered reporting on deactivated SCells and interruption probability (0.5%) without DRX (TDD 3 DL CA) | 12.7.0 | 12.8.0 |
|---------|-------|-----------|-------------|---|---|--------|--------|
| 06-2015 | RP-68 | RP-150965 | 2880 | | OTDOA RSTD Measurements on different secondary component carriers | 12.7.0 | 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 | 12.7.0 | 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 | 12.7.0 | 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 conditions R12 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150958 | 2887 | | E-UTRAN TDD with 20 MHz +10 MHz bandwidth to UTRAN TDD cell search under fading propagation conditions R12 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150957 | 2897 | | Further clarification of MBMSBLER reporting in section 9 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2903 r1 | 1 | Test case of FDD-FDD inter-frequency RSRQ measurement accuracy in discovery signal occasions | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2904 | | CR on side conditions for inter-frequency measurement for SCE | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2905 | | CR on test case for RSRQ TDD-TDD inter frequency measurement accuracy requirement for SCE | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150955 | 2906 r1 | 1 | Maximum Rx difference between Pcell and Scell in section 7.9 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2908 r1 | 1 | FDD-FDD intra frequency event triggered reporting in DRX based on CSI-RS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2909 r1 | 1 | TDD-TDD intra frequency event triggered reporting in DRX based on CSI-RS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2910 r1 | 1 | FDD-FDD inter frequency event triggered reporting in DRX based on CSI-RS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2911 r1 | 1 | TDD-TDD inter frequency event triggered reporting in DRX based on CSI-RS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2912 r1 | 1 | FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2913 r1 | 1 | TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150957 | 2915 r2 | 2 | CR of DC interruption requirements | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150965 | 2916 r1 | 1 | Event triggered reporting on deactivated SCells in non-DRX (FDD CA) | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150965 | 2917 r1 | 1 | Event triggered reporting on deactivated SCells in non-DRX (TDD CA) | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | 2919 r1 | 1 | Introduction of RRM test case for E-UTRAN TDD-FDD 3 DL CA activation and deactivation of known SCell in non-DRX with PCell in FDD | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | 2920 r1 | 1 | Introduction of RRM test case for E-UTRAN TDD-FDD 3 DL CA activation and deactivation of known SCell in non-DRX with PCell in TDD | 12.7.0 | 12.8.0 |
| 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 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150965 | 2921 a | | Correction of implementation of CR 2644 in Table A.9.8.1.1-1 | 12.7.0 | 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 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150959 | 2922 ar2 | 2 | Incmon CR for FDD-FDD Interfrequency correct reporting of measurement events without reduced performance group configured, non DRX | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150959 | 2923 r2 | 2 | Incmon CR for TDD-TDD Interfrequency correct reporting of measurement events without reduced performance group configured, non DRX | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2928 r1 | 1 | FDD RLM Test Case for Out-of-sync in DRX for PSCell in asynchronous DC | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2929 r1 | 1 | FDD RLM Test Case for In-sync in DRX for PSCell in asynchronous DC | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150954 | 2932 | | Correction of Cell Time offset in RSTD CA Test cases (Rel- 12) | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2933 r1 | 1 | Introduction of DC intra-frequency event triggered reporting with DRX in synchronous FDD DC | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2934 r1 | 1 | Introduction of DC intra-frequency event triggered reporting with DRX in synchronous TDD DC | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2935 r1 | 1 | Introduction of DC intra-frequency event triggered reporting with DRX in asynchronous FDD DC | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2936 r1 | 1 | Introduction of DC inter-frequency event triggered reporting with DRX in synchronous FDD DC | 12.7.0 | 12.8.0 |

| 06-2015 | RP-68 | RP-150963 | 2937 | 1 | Introduction of DC inter-frequency event triggered reporting | 12.7.0 | 12.8.0 |
|---------|-------|-----------|------------|---|---|--------|----------|
| | | | r1 | | with DRX in synchronous TDD DC | | |
| 06-2015 | RP-68 | RP-150959 | 2938 r1 | 1 | Testcases for E-UTRA Incmon idle interfrequency reselection | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150962 | 2940 r2 | 2 | CR on minimum number of subframes for discovery-based measurements | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2941 r1 | 1 | E-UTRAN FD-FDD Radio Link Monitoring Tests for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2942 r1 | 1 | E-UTRAN HD-FDD Radio Link Monitoring Tests for UE category 0 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2943 r1 | 1 | E-UTRAN TDD Radio Link Monitoring Tests for UE category | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150958 | 2944 r1 | 1 | Absolute and relative RSRP accuracies in FDD 3 DL CA | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150968 | 2945 r1 | 1 | Absolute and relative RSRP accuracies in TDD 3 DL CA | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | 2946 r1 | 1 | PCell in FDD: absolute and relative RSRQ accuracies in TDD-FDD 3 DL CA | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | 2947 r1 | 1 | PCell in TDD: absolute and relative RSRQ accuracies in TDD-FDD 3 DL CA | 12.7.0 | 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 | 12.7.0 | 12.8.0 |
| | | | | | DRX IncMon | | |
| 06-2015 | RP-68 | RP-150959 | 2951 | | TDD-TDD Interfrequency correct reporting of measurement events with reduced performance group configured for non | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2952 | 1 | DRX IncMon E-UTRAN FDD Radio Link Monitoring Test for In-sync in | 12.7.0 | 12.8.0 |
| | | | r1 | | DRX for PSCell in synchronous dual connectivity | | |
| 06-2015 | RP-68 | RP-150963 | 2953 r1 | 1 | E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous dual connectivity | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150961 | 2954 r1 | 1 | E-UTRAN FDD PCell interruption at transitions between active and non-active when DRX is used in PSCell in | 12.7.0 | 12.8.0 |
| | | | | | asynchronous dual connectivity | | |
| 06-2015 | RP-68 | RP-150958 | 2955 | | E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth R12 | 12.7.0 | 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 | 12.7.0 | 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 | 12.7.0 | 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 | 12.7.0 | 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 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150965 | 2962 | | Addition PDSCH RMC for 5MHz with user data | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | 2967 r1 | 1 | 3 DL CA Phase II tests # 1-2: RSRP measurement accuracies for TDD-FDD CA | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2971 | 1 | PSCell Add and Release Delay Tests for Synchronous DC | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | r1 2972 | 1 | PSCell Add and Release Delay Tests for Asynchronous DC | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150959 | r1 2975 | 1 | Idle mode FDD to UTRA FDD interRAT reselection | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150959 | r1 2976 | 1 | Idle mode TDD to UTRA FDD interRAT reselection | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150959 | r1 2977 | | E-UTRA FDD InterRAT UTRA FDD correct reporting of | 12.7.0 | 12.8.0 |
| | | | | | measurement events with reduced performance group configured, non DRX | | |
| 06-2015 | RP-68 | RP-150959 | 2978 | | E-UTRA TDD InterRAT UTRA FDD correct reporting of measurement events with reduced performance group | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2979 | 1 | configured, non DRX E-UTRAN FDD PCell interruption at transitions between | 12.7.0 | 12.8.0 |
| | | | r1 | | active and non-active when DRX is used in PSCell in synchronous dual connectivity | | <u> </u> |
| 06-2015 | RP-68 | RP-150963 | 2980 r1 | 1 | E-UTRAN TDD PCell interruption at transitions between active and non-active when DRX is used in PSCell in synchronous dual connectivity | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150963 | 2981 r1 | 1 | E-UTRAN FDD inter-frequency event triggered reporting in asynchronous dual connectivity | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150958 | 2984 r1 | 1 | Modification for interruption period for SCell (de-)activation with 3DL | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150959 | 2987 r1 | 1 | Test cases of Idle mode E-UTRA to UTRA TDD interRAT cell reselection for IncMon | 12.7.0 | 12.8.0 |
| | | | 2988 | 1 | Test cases of Interfrequency correct reporting of | 12.7.0 | 12.8.0 |

| | | 1 | 1 | | configured, DRX | 1 | 1 |
|--------------------|----------------|------------------------|--------------|--------------|---|------------------|------------------|
| 06-2015 | RP-68 | RP-150963 | 2989 | 2 | E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in | 12.7.0 | 12.8.0 |
| 00 2010 | 111 00 | 141 100000 | r2 | _ | DRX for PSCell in synchronous dual connectivity | 12.7.0 | 12.0.0 |
| 06-2015 | RP-68 | RP-150963 | 2990 | 2 | E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in | 12.7.0 | 12.8.0 |
| | | | r2 | | DRX for PSCell in synchronous dual connectivity | | |
| 06-2015 | RP-68 | RP-150957 | 2992 | | CR on interruption during D2D discovery for D2D single RF | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150965 | 2993 | | chain CR on E-UTRAN TDD-TDD inter frequency measurements | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150965 | 2993 | | when DRX is used | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150965 | 2998 | | Test case of FDD-FDD inter-frequency new RSRQ | 12.7.0 | 12.8.0 |
| 00 2010 | 111 00 | 141 100000 | 2000 | | measurement accuracy | 12.7.0 | 12.0.0 |
| 06-2015 | RP-68 | RP-150965 | 2999 | | Test case of TDD-TDD inter-frequency new RSRQ | 12.7.0 | 12.8.0 |
| | | | | | measurement accuracy | | |
| 06-2015 | RP-68 | RP-150955 | 3001 | | Correction to felCIC cell configurations in RLM | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150955 | 3003 | | Correction to A.8.1.8 | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | 3004 | 1 | CR on absolute and relative RSRQ accuracies in TDD 3DL CA | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | r1 3005 | 1 | CR on absolute and relative RSRQ accuracies in FDD 3DL | 12.7.0 | 12.8.0 |
| 00-2013 | KF-00 | KF-130912 | r1 | ' | CA | 12.7.0 | 12.0.0 |
| 06-2015 | RP-68 | RP-150965 | 3006 | | CR for test case of new RSRQ measurement accuracy in | 12.7.0 | 12.8.0 |
| | | | | | FDD | | |
| 06-2015 | RP-68 | RP-150965 | 3007 | | CR for test case of new RSRQ measurement accuracy in | 12.7.0 | 12.8.0 |
| | | | | . | TDD | 1.5 = 1 | 45 |
| 06-2015 | RP-68 | RP-150972 | 3008 | 1 | RSTD measurement reporting in FDD 3 DL CA | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150972 | r1 3009 | 1 | RSTD measurement reporting in TDD 3 DL CA | 12.7.0 | 12.8.0 |
| 06-2015 | KP-00 | RP-150972 | r1 | ' | RSTD measurement reporting in TDD 3 DL CA | 12.7.0 | 12.6.0 |
| 06-2015 | RP-68 | RP-150972 | 3010 | 1 | RSTD measurement accuracy in FDD 3 DL CA | 12.7.0 | 12.8.0 |
| 00 20.0 | 00 | | r1 | | 1.0.2 | | 12.0.0 |
| 06-2015 | RP-68 | RP-150972 | 3011 | 1 | RSTD measurement accuracy in TDD 3 DL CA | 12.7.0 | 12.8.0 |
| | | | r1 | | | | |
| 06-2015 | RP-68 | RP-150964 | 3012 | 2 | Clarification of ProSe requirements in ONC | 12.7.0 | 12.8.0 |
| 00.0045 | RP-68 | DD 450057 | r2 3013 | | Compation to Asymphysical Description and for DC for only | 40.70 | 12.8.0 |
| 06-2015 | RP-68 | RP-150957 | 3013 | | Correction to Asynchronous Requirements for DC for only FDD-FDD | 12.7.0 | 12.8.0 |
| 06-2015 | RP-68 | RP-150959 | 3014 | | E-UTRA TDD InterRAT UTRA TDD correct reporting of | 12.7.0 | 12.8.0 |
| 00 2010 | 111 00 | 141 100000 | 0011 | | measurement events with reduced performance group | 12.7.0 | 12.0.0 |
| | | | | | configured non DRX IncMon | | |
| 06-2015 | RP-68 | RP-150959 | 3015 | | E-UTRA FDD InterRAT UTRA TDD correct reporting of | 12.7.0 | 12.8.0 |
| | | | | | measurement events with reduced performance group | | |
| 06-2015 | RP-68 | RP-150958 | 3016 | | configured non DRX for IncMon Correction to E-UTRA TDD event triggered reporting under | 12.7.0 | 12.8.0 |
| 00-2015 | KP-00 | KP-150956 | 3016 | | deactivated SCell in non-DRX for 20 MHz + 10 MHz | 12.7.0 | 12.6.0 |
| 06-2015 | RP-68 | RP-150969 | 2893 | | Carrier aggragation test cases for band 31 | 12.8.0 | 13.0.0 |
| 06-2015 | RP-68 | RP-150974 | 2966 | | 4DL CA RRM requirements for "UE Measurements | 12.8.0 | 13.0.0 |
| | | | | | Procedures in RRC_CONNECTED State" | | |
| 06-2015 | RP-68 | RP-150974 | 2970 | 1 | RRM Requirements in Section 7 for 4 DL CA | 12.8.0 | 13.0.0 |
| 09-2015 | RP-69 | RP-151475 | 3020 | - | Correction of Ior/loc value in RRM Test case A.4.3.1.1 | 13.0.0 | 13.1.0 |
| 09-2015 | RP-69 | RP-151479 | 3022 | - | Cleanup of 3DL CA RRM Test cases | 13.0.0 | 13.1.0 |
| 09-2015 09-2015 | RP-69 RP-69 | RP-151483 | 3031 | - | Time offset between cells Requirements for DC on ACK/NACK reporting for | 13.0.0 13.0.0 | 13.1.0 |
| 09-2015 | KP-69 | RP-151497 | 3032 | - | measurements using autonomous gaps | 13.0.0 | 13.1.0 |
| 09-2015 | RP-69 | RP-151475 | 3034 | - | Interruptions at overlapping | 13.0.0 | 13.1.0 |
| 00 2010 | 141 00 | 141 101 110 | 0001 | | addition/release/activation/deactivation of SCells | 10.0.0 | 10.1.0 |
| 09-2015 | RP-69 | RP-151504 | 3035 | - | RRM Requirements for 3 DL/2UL Inter-band CA | 13.0.0 | 13.1.0 |
| 09-2015 | RP-69 | RP-151483 | 3037 | - | CR on editorial corrections in TS36133 in Rel-13 | 13.0.0 | 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 | 13.0.0 | 13.1.0 |
| 00.0017 | DD 65 | DD 454500 | 0011 | | Rel-13 | 40.00 | 40.4.5 |
| 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 | 13.0.0 | 13.1.0 |
| 09-2015 | RP-69 | RP-151500 | 3043 | | 3DL CA Phase II tests #16 SCell activation and deactivation | 13.0.0 | 13.1.0 |
| 00-2010 | 111 -03 | 131300 | 3043 | | for unknown SCells without DRX (TDD 3 DL CA) in Rel-13 | 13.0.0 | 15.1.0 |
| 09-2015 | RP-69 | RP-151475 | 3045 | - | Modifying test case of E-UTRAN 2DL TDD CA activation of | 13.0.0 | 13.1.0 |
| | | | | | unknown SCell in non-DRX in Rel-13 | | |
| 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 | 13.0.0 | 13.1.0 |
| 09-2015 | RP-69 | RP-151479 | 3052 | - | Correction of inconsistency in 3 DL CA Event Triggered | 13.0.0 | 13.1.0 |
| 00 2045 | DD CC | DD 454 470 | 2054 | | Reporting under Deactivated SCells in Non-DRX | 12.00 | 12.1.0 |
| 09-2015 09-2015 | RP-69 RP-69 | RP-151479 RP-151483 | 3054 3062 | - | CR on Interruptions at PSCell Addition/release Corrections to the RMC configurations in 36.133 R13 | 13.0.0 13.0.0 | 13.1.0 13.1.0 |
| 09-2015 | RP-69 | RP-151463 RP-151479 | 3064 | - | Remove the Brackets in RLM Tests for UE category 0 R13 | 13.0.0 | 13.1.0 |
| 09-2015 | RP-69 | RP-151479 | 3066 | 1 | Adding SNR values to DC RLM test cases R13 | 13.0.0 | 13.1.0 |
| 09-2015 | RP-69 | RP-151486 | 3068 | - | Correction on Band 31 test cases R13 | 13.0.0 | 13.1.0 |
| 09-2015 | RP-69 | RP-151483 | 3070 | _ | Correction to UE transmit timing accuracy tests R13 | 13.0.0 | 13.1.0 |
| | | | | | · | | |

| 09-2015 | RP-69 | RP-151500 | 3078 | - | 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 | 13.0.0 | 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 | 13.0.0 | 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 | 13.0.0 | 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 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152136 | 3088 | - | Remove brackets in RSTD measurement accuracy R13 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152133 | 3090 | - | Remove bracket for CSI-RSRP measurement R13 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152133 | 3094 | - | Correction to E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD R13 | 13.1.0 | 13.2.0 |
| 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 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152133 | 3098 | - | Correction to E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD R13 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152133 | 3100 | - | Correction to E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD R13 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152133 | 3102 | - | Correction to RSRP for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD R13 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152133 | 3104 | - | Correction to RSRP for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD R13 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152133 | 3106 | - | Correction to RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD R13 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152133 | 3108 | - | Correction to RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD R13 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152136 | 3114 | - | Alignment of UE reporting criteria requirements | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152131 | 3116 | - | Removal of square brackets for some CA requirements | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152133 | 3118 | - | Cleanup of 3DL CA RRM Test cases | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152134 | 3121 | - | Correction of definition of antenna connection in some RSTD tests | 13.1.0 | 13.2.0 |
| | | | | | | | |
| 12-2015 | RP-70 | RP-152133 | 3129 | - | Different TDD configurations for OTDOA in CA in release 12 | 13.1.0 | 13.2.0 |
| 12-2015 | RP-70 | RP-152157 | 3131 | - | Introduction of Band 67 | 13.1.0 | 13.2.0 |
| 12-2015 12-2015 | RP-70 RP-70 | RP-152157 RP-152133 | 3131 3136 | - | Introduction of Band 67 Correction of definition of pTAG and psTAG | 13.1.0 13.1.0 | 13.2.0 13.2.0 |
| 12-2015 | RP-70 | RP-152157 | 3131 | - | Introduction of Band 67 Correction of definition of pTAG and psTAG Title of new section A.7.4 in TS36.133 for Rel-13 SNR levels and Reference channels for DC RLM test cases | 13.1.0 | 13.2.0 |
| 12-2015 12-2015 12-2015 12-2015 | RP-70 RP-70 RP-70 RP-70 | RP-152157 RP-152133 RP-152133 RP-152133 | 3131 3136 3145 3146 | - - - | Introduction of Band 67 Correction of definition of pTAG and psTAG Title of new section A.7.4 in TS36.133 for Rel-13 SNR levels and Reference channels for DC RLM test cases for Rel-13 | 13.1.0 13.1.0 13.1.0 13.1.0 | 13.2.0 13.2.0 13.2.0 13.2.0 |
| 12-2015 12-2015 12-2015 | RP-70 RP-70 RP-70 | RP-152157 RP-152133 RP-152133 | 3131 3136 3145 | | Introduction of Band 67 Correction of definition of pTAG and psTAG Title of new section A.7.4 in TS36.133 for Rel-13 SNR levels and Reference channels for DC RLM test cases | 13.1.0 13.1.0 13.1.0 | 13.2.0 13.2.0 13.2.0 |
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| 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 | RP-70 RP-70 RP-70 RP-70 RP-70 | RP-152157 RP-152133 RP-152133 RP-152133 RP-152131 RP-152131 | 3131 3136 3145 3146 3150 3167 | | Introduction of Band 67 Correction of definition of pTAG and psTAG Title of new section A.7.4 in TS36.133 for Rel-13 SNR levels and Reference channels for DC RLM test cases for Rel-13 Correction on measurement category for reporting criteria Alignment of dB values for 2DL CA activation and deactivation Test cases CR on editorial cleanup for D2D RRM requirements Correction to Trstd values in 3DL RSTD Measurement Accuracy test cases | 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 | 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 |
| 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 | RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 | RP-152157 RP-152133 RP-152133 RP-152133 RP-152131 RP-152133 RP-152135 RP-152136 | 3131 3136 3145 3146 3150 3167 3173 3178 | | Introduction of Band 67 Correction of definition of pTAG and psTAG Title of new section A.7.4 in TS36.133 for Rel-13 SNR levels and Reference channels for DC RLM test cases for Rel-13 Correction on measurement category for reporting criteria Alignment of dB values for 2DL CA activation and deactivation Test cases CR on editorial cleanup for D2D RRM requirements Correction to Trstd values in 3DL RSTD Measurement Accuracy test cases Update of 2DL CA activation and deactivation of unknown SCell Test cases A.8.16.19+A.8.16.20 | 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 | 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 |
| 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 | RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 | RP-152157 RP-152133 RP-152133 RP-152133 RP-152131 RP-152133 RP-152135 RP-152136 RP-152133 | 3131 3136 3145 3146 3150 3167 3173 3178 3183 | | Introduction of Band 67 Correction of definition of pTAG and psTAG Title of new section A.7.4 in TS36.133 for Rel-13 SNR levels and Reference channels for DC RLM test cases for Rel-13 Correction on measurement category for reporting criteria Alignment of dB values for 2DL CA activation and deactivation Test cases CR on editorial cleanup for D2D RRM requirements Correction to Trstd values in 3DL RSTD Measurement Accuracy test cases Update of 2DL CA activation and deactivation of unknown SCell Test cases A.8.16.19+A.8.16.20 Update of 3DL CA activation and deactivation of unknown SCell Test cases A.8.16.41+A.8.16.42 | 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 | 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 |
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| 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 12-2015 | RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 RP-70 | RP-152157 RP-152133 RP-152133 RP-152131 RP-152131 RP-152135 RP-152136 RP-152133 RP-152133 RP-152133 RP-152133 RP-152133 RP-152133 | 3131 3136 3145 3146 3150 3167 3173 3178 3183 3185 3187 3189 | 2 | Introduction of Band 67 Correction of definition of pTAG and psTAG Title of new section A.7.4 in TS36.133 for Rel-13 SNR levels and Reference channels for DC RLM test cases for Rel-13 Correction on measurement category for reporting criteria Alignment of dB values for 2DL CA activation and deactivation Test cases CR on editorial cleanup for D2D RRM requirements Correction to Trstd values in 3DL RSTD Measurement Accuracy test cases Update of 2DL CA activation and deactivation of unknown SCell Test cases A.8.16.19+A.8.16.20 Update of 3DL CA activation and deactivation of unknown SCell Test cases A.8.16.41+A.8.16.42 Update to RRM test case for E-UTRAN TDD-FDD 3DL CA activation and deactivation of unknown SCell in non-DRX with PCell in FDD Update to RRM test case for E-UTRAN TDD-FDD 3DL CA activation and deactivation of unknown SCell in non-DRX with PCell in TDD Correction to Cells in OTDOA assistance data in 3DL RSTD Measurement Reporting Delay test cases CR on RS-SINR accuracy in 36.133 | 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 13.1.0 | 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 13.2.0 |
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History

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| V13.2.0 | April 2016 | Publication | | | | | | | | |
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