**3GPP TSG- Meeting # *R5-25***

**Malta, Malta, 19th May 2025 - 23rd May 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.533** | **CR** | **<CR#>** | **rev** | **-** | **Current version:** | **18.6.1** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | RRM Spec quality improvement draft CR clauses 18 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Keysight Technologies | | | | | | | | | |
| ***Source to TSG:*** | R5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_NTN\_solutions\_plus\_CT-UEConTest | | | | |  | ***Date:*** | | | 2025-05-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19) Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | According to the agreed WF in R5-251000, the identified issues are to be corrected. Per the work split, the CR is for clause 18 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Some errors/ inconsistency in the spec. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 18 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## <<< START OF CHANGES >>>

# 18 E-UTRA - NR inter-RAT with E-UTRA serving cell for RedCap

## 18.1 RRC\_IDLE state mobility for RedCap

### 18.1.1 Inter-RAT cell re-selection for RedCap

#### 18.1.1.0 Minimum conformance requirements

TBD

#### 18.1.1.1 E-UTRA - NR SA FR1 E-UTRA cell re-selection to higher priority NR target Cell for 2 Rx UE

Editor's Note: This test case is incomplete in following aspects:

- Message contents are missing.

- Test procedure is TBD

- Test applicability is missing

- Cell mapping is missing

18.1.1.1.1 Test purpose

The purpose of this test is to verify the requirement for the E-UTRA - NR SA FR1 inter-RAT cell reselection for RedCap UEs. The requirements are specified in TS 38.133 [6] in clause TBD.

18.1.1.1.2 Test applicability

This test applies to all types of NR RedCap UE release 17 and forward.

18.1.1.1.3 Minimum conformance requirements

The minimum conformance requirements are defined in clause 18.1.1.0.x.

The normative reference for this requirement is TS 38.133 [6] clause A.18.1.1.1.

18.1.1.1.4 Test description

18.1.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 18.1.1.1.4.1-1.

Table 18.1.1.1.4.1-1: Supported test configurations for E-UTRA - NR SA FR1 E-UTRA Cell re-selection to higher priority NR target Cell in FR1

|  |  |
| --- | --- |
| Configuration | Description |
| 18.1.1.1-1 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.1.1.1-2 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.1.1.1-3 | LTE FDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.1.1.1-4 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.1.1.1-5 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.1.1.1-6 | LTE TDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.1.1.1-7 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| 18.1.1.1-8 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Configure the test equipment and the DUT according to the parameters in Table 18.1.1.1.4.1-2.

Table 18.1.1.1.4.1-2: Initial conditions for E-UTRA - NR SA FR1 E-UTRA Cell re-selection to higher priority NR target Cell in FR1

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 38.508-1 [14] clause 4.1. |
| Test frequencies | As specified in Annex E, table E.4-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 6.1.1.2.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in Annex C.2.2. |
| Connection Diagram | TE Part | TBD | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | TBD |
| Exceptions to connection diagram | Without faders. | |  |

1. The general test parameter settings are set up according to Table 18.1.1.1.4.1-3.

2. Message contents are defined in clause 18.1.1.1.4.3.

3. The test scenario comprises of 1 E-UTRA cell and 1 NR cell. 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 18.1.1.1.4.1-3: General test parameters for E-UTRA - NR SA FR1 E-UTRA Cell re-selection to higher priority NR target Cell in FR1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Value | Comment |
| Initial condition | Active cell |  | 1, 2, 3, 4, 5, 6, 7, 8 | Cell2 | The UE camps on cell 2 in the initial phase |
| Neighbour cell |  | 1, 2, 3, 4, 5, 6, 7, 8 | Cell1 |
| T1 end condition | Active cell |  |  | Cell1 | During T1 period the UE reselects to cell 1 |
|  | Neighbour cell |  |  | Cell2 |  |
| T3 end condition | Active cell |  | 1, 2, 3, 4, 5, 6, 7, 8 | Cell2 | The UE shall perform reselection to cell 2 during T3 |
| Neighbour cell |  | 1, 2, 3, 4, 5, 6, 7, 8 | Cell1 |
| RF Channel Number | |  | 1, 2, 3, 4, 5, 6, 7, 8 | 1, 2 | E-UTRAN radio channel (1) and NR radio channel (2) are used for this test |
| Time offset between cells | |  | 1, 4, 7, 8 | 3 ms | Asynchronous cells |
| 2, 5 | 3 μs | Synchronous cells |
| 3, 6 | 3 μs | Synchronous cells |
| Access Barring Information | | - | 1, 2, 3, 4, 5, 6, 7, 8 | Not Sent | No additional delays in random access procedure. |
| DRX cycle length | | s | 1, 2, 3, 4, 5, 6, 7, 8 | 1.28 | The value shall be used for all cells in the test. |
| NR PRACH configuration index | |  | 1, 2, 3, 4, 5, 6, 7, 8 | 102 | The detailed configuration is specified in TS 38.211 clause 6.3.3.2 |
| T1 | | s | 1, 2, 3, 4, 5, 6, 7, 8 | 15 | T1 needs to be defined so that cell re-selection reaction time is taken into account. |
| T2 | | s | 1, 2, 3, 4, 5, 6, 7, 8 | >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 | 1, 2, 3, 4, 5, 6, 7, 8 | 75 | T3 needs to be defined so that cell re-selection reaction time is taken into account. |

18.1.1.1.4.2 Test procedure

TBD

18.1.1.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

TBD

18.1.1.1.5 Test requirement

Table 18.1.1.1.5-1 defines the primary level settings including test tolerances for NR – E-UTRA cell re-selection test case in AWGN for 2 Rx UE.

Table 18.1.1.1.5-1: NR cell 2 specific test parameters for E-UTRA - NR SA FR1 E-UTRA Cell reselection to higher priority NR target Cell in FR1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 2 | | |
| T1 | T2 | T3 |
| TDD configuration |  | 1, 4, 7, 8 | N/A | | |
| 2, 5 | TDDConf.1.1 | | |
| 3, 6 | TDDConf.2.1 | | |
| PDSCH Reference measurement channel |  | 1, 4, 7, 8 | SR.1.1 FDD | | |
| 2, 5 | SR.1.1 TDD | | |
| 3, 6 | SR.2.1 TDD | | |
| RMSI CORESET Reference Channel |  | 1, 4, 7, 8 | CR.1.1 FDD | | |
| 2, 5 | CR.1.1 TDD | | |
| 3, 6 | CR.2.1 TDD | | |
| RMC CORESET Reference Channel |  | 1, 4, 7, 8 | CCR.1.1 FDD | | |
| 2, 5 | CCR.1.1 TDD | | |
| 3, 6 | CCR.2.1 TDD | | |
| OCNG Patterns |  | 1, 2, 3, 4, 5, 6, 7, 8 | OP.1 | | |
| SMTC configuration |  | 1, 2, 3, 4, 5, 6, 7, 8 | SMTC.1 | | |
| SSB configuration |  | 1, 4, 7, 8 | SSB.1 FR1 | | |
| 2, 5 | SSB.1 FR1 | | |
| 3, 6 | SSB.1 RedCap FR1 | | |
| Initial DL BWP configuration |  | 1, 2, 3, 4, 5, 6, 7, 8 | DLBWP.0.1 | | |
| Initial UL BWP configuration |  | 1, 2, 3, 4, 5, 6, 7, 8 | ULBWP.0.1 | | |
| RLM-RS |  | 1, 2, 3, 4, 5, 6, 7, 8 | SSB | | |
| Qrxlevmin | dBm/SCS | 1, 2, 4, 5, 7, 8 | -140 | | |
| 3, 6 | -137 | | |
| Pcompensation | dB | 1, 2, 3, 4, 5, 6, 7, 8 | 0 | | |
| Qhysts | dB | 1, 2, 3, 4, 5, 6 | 0 | | |
| Qoffsets, n | dB | 1, 2, 3, 4, 5, 6, 7, 8 | 0 | | |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | 1, 2, 3, 4, 5, 6, 7, 8 | SS-RSRP | | |
|  | dB | 1, 4, 7, 8 | -3.65 | -infinity | 13.55 |
| 2, 5 |
| 3, 6 |
| Note2 | dBm/SCS | 1, 4, 7, 8 | -99.90 | -98 | -98 |
| 2, 5 | -99.90 | -98 | -98 |
| 3, 6 | -96.90 | -95 | -95 |
| Note2 | dBm/15 kHz | 1, 4, 7, 8 | -99.90 | -98 | -98 |
| 2, 5 |
| 3, 6 |
|  | dB | 1, 4, 7, 8 | -3.65 | -infinity | 13.55 |
| 2, 5 |
| 3, 6 |
| SS-RSRP Note3 | dBm/SCS | 1, 4, 7, 8 | -103.55 | -infinity | -84.45 |
| 2, 5 | -103.55 | -infinity | -84.45 |
| 3, 6 | -100.54 | -infinity | -81.44 |
| Io | dBm/9.36 MHz | 1, 4, 7, 8 | -70.39 | -70.05 | -56.31 |
| dBm/9.36 MHz | 2, 5 | -70.39 | -70.05 | -56.31 |
| dBm/18.36 MHz | 3, 6 | -67.46 | -67.12 | -53.38 |
| Treselection | s | 1, 2, 3, 4, 5, 6, 7, 8 | 0 | 0 | 0 |
| SnonintrasearchP | dB | 1, 2, 3, 4, 5, 6, 7, 8 | 50 | | |
| Threshx, highP | dB | 1, 2, 3, 4, 5, 6, 7, 8 | 48 | | |
| Threshserving, lowP | dB | 1, 2, 3, 4, 5, 6, 7, 8 | 44 | | |
| Threshx, lowP | dB | 1, 2, 3, 4, 5, 6, 7, 8 | 50 | | |
| Propagation Condition |  | 1, 2, 3, 4, 5, 6, 7, 8 | 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  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | |

Table 18.1.1.1.5-2: E-UTRA cell 1 specific test parameters for E-UTRA - NR SA FR1 E-UTRA Cell reselection to higher priority NR target Cell in FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Cell 1 | | |
| T1 | T2 | T3 |
| E-UTRA RF Channel number |  | 1 | | |
| BWchannel | MHz | 10 | | |
| OCNG Patterns defined in TS 36.133 [15] clause A.3.2 |  | OP.2 FDD for test configuration 1, 2, 3, 7;  OP.2 TDD for test configuration 4, 5, 6, 8 | | |
| PBCH\_RA | dB | 0 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -140 | | |
| Note 2 | dBm/15 kHz | -98 | | |
| RSRP Note 3 | dBm/15 KHz | -84 | -84 | -82.45 |
|  | dB | 14 | 14 | 15.55 |
|  | dB | 14 | 14 | 15.55 |
| TreselectionEUTRAN | S | 0 | | |
| SnonintrasearchP | dB | 50 | | |
| Threshx, highP | dB | 48 | | |
| Threshserving, lowP | dB | 44 | | |
| Threshx, lowP | dB | 50 | | |
| 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  to be fulfilled.  Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | |

The cell reselection delay to a higher priority NR cell 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 *RRCSetupRequest* message to perform a registration procedure for mobility and periodic registration update on cell 2.

The cell re-selection delay to a higher priority cell shall be less than 68 s.

NOTE: The cell re-selection delay to a higher priority cell can be expressed as: Thigher\_priority\_search + Tevaluate, NR + TSI-NR, and to a lower priority cell can be expressed as: Tevaluate, NR + TSI-NR,

The rate of correct events observed during repeated tests shall be at least 90% with the confidence level of 95%.

## 18.2 RRC\_CONNECTED state mobility for RedCap

### 18.2.1 Handover for RedCap

#### 18.2.1.0 Minimum conformance requirements

Then minimum requirements given in clause 16.3.1.0.2 apply.

The normative reference for this requirement is TS 36.133 [23] clause 5.3.4B.

#### 18.2.1.1 E-UTRA - NR SA FR1 handover for 2 Rx UE

18.2.1.1.1 Test purpose

To verify the E-UTRAN to NR FR1 handover requirements for 2RX RedCap as specified in TS 36.133 [23] clause 5.3.4B.

18.2.1.1.2 Test applicability

This test applies to all E-UTRA UE from release 17 onwards and capable of NR RedCap with 2Rx.

18.2.1.1.3 Minimum conformance requirements

The minimum conformance requirements are defined in clause 18.2.1.0

The normative reference for this requirement is TS 38.133 [6] clause A.18.2.1.1.

18.2.1.1.4 Test description

Same as the test description given in clause 8.3.1.1.4.

18.2.1.1.4.1 Initial conditions

Same as the initial conditions given in clause 8.3.1.1.4.1 with following exceptions:

- Table 8.3.1.1.4.1-1 is replaced by Table 18.2.1.1.4.1-1.

- Table 8.3.1.1.4.1-2 is replaced by Table 18.2.1.1.4.1-2.

- Table 8.3.1.1.4.1-3 is replaced by Table 18.2.1.1.4.1-3.

Table 18.2.1.1.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.2.1.1-1 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.2.1.1-2 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.2.1.1-3 | LTE FDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.2.1.1-4 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| 18.2.1.1-5 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.2.1.1-6 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.2.1.1-7 | LTE TDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.2.1.1-8 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Table 18.2.1.1.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 36.508 [25] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.6-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 18.2.1.1.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in clause C.2.1 |
| Connection Diagram | TE Part | A.3.1.8.2 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.2.3.4 |
| Exceptions to connection diagram | N/A | |  |

Table 18.2.1.1.4.1-3: General test parameters for E-UTRAN inter-RAT NR handover

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| NR RF Channel Number | |  | 1 | 1 NR carrier frequency is used in the test |
| LTE RF Channel Number | |  | 2 | 1 E-UTRAN carrier frequency is used in the test |
| Initial conditions | Active cell |  | Cell 1 | E-UTRAN cell |
| Neighbouring cell |  | Cell 2 | NR cell |
| Final condition | Active cell |  | Cell 2 |  |
| NR measurement quantity | |  | SS-RSRP |  |
| E-UTRAN measurement quantity | |  | RSRP |  |
| b2-Threshold1 | | dBm | -83 | Absolute E-UTRAN RSRP threshold for event B2 |
| b2-Threshold2NR | | dBm | As specified in Table 18.2.1.1.5-2 | Absolute NR SS-RSRP 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 |
| Time offset between cells | |  | 3 ms | Asynchronous cells |
| Gap pattern configuration Id | |  | 0 | As specified in Table 8.1.2.1-1 started before T2 starts [23] |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |

18.2.1.1.4.2 Test procedure

Same as the test procedure given in clause 8.3.1.1.4.2.

18.2.1.1.4.3 Message contents

Same as the message contents given in clause 8.3.1.1.4.3 with following exceptions.

- Table 7.3.1-3 in TS 38.508-1 [14] is used with condition SMTC.1 RedCap.

18.2.1.1.5 Test requirement

Same as the test requirements given in clause 8.3.1.1.5 with following exceptions:

- Table 8.3.1.1.5-1 is replaced by Table 18.2.1.1.5-1.

- Table 8.3.1.1.5-2 is replaced by Table 18.2.1.1.5-2.

Table 18.2.1.1.5-1: Cell specific test parameters for E-UTRAN inter-RAT NR handover (Cell 1)

| Parameter | Unit | Configuration | Cell 1 | | |
| --- | --- | --- | --- | --- | --- |
| T1 | T2 | T3 |
| RF channel number |  | 1,2,3,4,5,6,7,8 | 2 | | |
| Duplex mode |  | 1,2,3,4 | FDD | | |
| 5,6,7,8 | TDD | | |
| TDD special subframe configurationNote1 |  | 5,6,7,8 | 6 | | |
| TDD uplink-downlink configurationNote1 |  | 5,6,7,8 | 1 | | |
| BWchannel | MHz | 1,2,3,4,5,6,7,8 | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | | |
| PRACH ConfigurationNote2 |  | 1,2,3,4 | 4 | | |
| 5,6,7,8 | 53 | | |
| PDSCH parameters:  DL Reference Measurement ChannelNote3 |  | 1,2,3,4 | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | | |
| 5,6,7,8 | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote3 |  | 1,2,3,4 | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | | |
| 5,6,7,8 | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | | |
| OCNG PatternsNote3 |  | 1,2,3,4 | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | | |
| 5,6,7,8 | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | | |
| PBCH\_RA | dB | 1,2,3,4,5,6,7,8 | 0 | | |
| PBCH\_RB |
| PSS\_RA |
| SSS\_RA |
| PCFICH\_RB |
| PHICH\_RA |
| PHICH\_RB |
| PDCCH\_RA |
| PDCCH\_RB |
| PDSCH\_RA |
| PDSCH\_RB |
| OCNG\_RANote4 |
| OCNG\_RBNote4 |
| NocNote5 | dBm/15kHz | 1,2,3,4,5,6,7,8 | -98 | | |
| Ês/Noc | dB | 1,2,3,4,5,6,7,8 | 7 | 5.45 Note 8 | 5.45 Note 8 |
| Ês/IotNote6 | dB | 1,2,3,4,5,6,7,8 | 7 | 5.45 | 5.45 |
| RSRPNote6 | dBm/15kHz | 1,2,3,4,5,6,7,8 | -91 | -92.55 | -92.55 |
| SCH\_RPNote6 | dBm/15kHz | 1,2,3,4,5,6,7,8 | -91 | -92.55 | -92.55 |
| IoNote6 | dBm/9MHz | 1,2,3,4,5,6,7,8 | -62.43 | -63.68 | -63.68 |
| Propagation Condition |  | 1,2,3,4,5,6,7,8 | AWGN | | |
| Antenna Configuration and Correlation Matrix Note7 |  | 1,2,3,4,5,6,7,8 | 1x2 Low | | |
| NOTE 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [23].  NOTE 2: PRACH configurations are specified in table 5.7.1-2 and table 5.7.1-3 in TS 36.211 [23].  NOTE 3: DL RMCs and OCNG patterns are specified in clauses A.3.1 and A.3.2 of TS 36.133 [15] respectively.  NOTE 4: 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 5: Interference from other cells and noise sources 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 6: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  NOTE 7: Propagation condition and correlation matrix are defined in clause B.2 in TS 36.101 [27].  NOTE 8: Including test tolerance given in Annex F. | | | | | |

Table 18.2.1.1.5-2: Cell specific test parameters E-UTRAN inter-RAT NR handover (Cell 2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Configuration | Cell 2 | | |
|  | T1 | T2 | T3 |
| RF channel number | |  | 1,2,3,4,5,6,7,8 | 1 | | |
| Duplex mode | |  | 1,5 | FDD | | |
| 2,3,6,7 | TDD | | |
| 4.8 | HD-FDD | | |
| TDD Configuration | |  | 2 6 | TDDConf.1.1 | | |
| 3,7 | TDDConf.2.1 | | |
| BWchannel | | MHz | 1,4,5,8 | 10: NRB,c = 52 (FDD) | | |
| 2,6 | 10: NRB,c = 52 (TDD) | | |
| 3,7 | 20: NRB,c = 51 (TDD) | | |
| PDSCH reference measurement channel | |  | 1,4,5,8 | SR.1.1 FDD | | |
| 2,6 | SR.1.1 TDD | | |
| 3,7 | SR.2.1 TDD | | |
| CORSET reference channel | |  | 1,4,5,8 | CR.1.1 FDD | | |
| 2,6 | CR.1.1 TDD | | |
| 3,7 | CR.2.1 TDD | | |
| PRACH configuration | |  | 1,2,3,4,5,6,7,8 | PRACH.1 FR1 | | |
| OCNG patternNote1 | |  | 1,2,3,4,5,6,7,8 | OP.1 | | |
| BWP | Initial DL BWP |  | 1,2,3,4,5,6,7,8 | DLBWP.0.1 | | |
| Dedicated DL BWP | DLBWP.1.1 | | |
| Initial UL BWP | ULBWP.0.1 | | |
| Dedicated UL BWP | ULBWP.1.1 | | |
| SMTC configuration | |  | 1,2,3,4,5,6,7,8 | SMTC.1 RedCap | | |
| SSB configuration | |  | 1,2,4,5,6,8 | SSB.4 RedCap FR1 | | |
| 3,7 | SSB.2 RedCap FR1 | | |
| b2-Threshold2NR | | dBm | 1,2,4,5,6,8 | -106 | | |
| 3,7 | -103 | | |
| EPRE ratio of PSS to SSS | | dB | 1,2,3,4,5,6,7,8 | 0 | | |
| EPRE ratio of PBCH\_DMRS to SSS | |
| EPRE ratio of PBCH to PBCH\_DMRS | |
| EPRE ratio of PDCCH\_DMRS to SSS | |
| EPRE ratio of PDCCH to PDCCH\_DMRS | |
| EPRE ratio of PDSCH\_DMRS to SSS | |
| EPRE ratio of PDSCH to PDSCH\_DMRS | |
| EPRE ratio of OCNG DMRS to SSS | |
| EPRE ratio of OCNG to OCNG DMRS | |
| *Noc*Note2 | | dBm/15 KHz | 1,2,3,4,5,6,7,8 | -98 | | |
| *Noc*Note2 | | dBm/SCS | 1,2,4,5,6,8 | -98 | | |
| 3,7 | -95 | | |
| Ês/Noc | | dB | 1,2,3,4,5,6,7,8 | -infinity | 1.55 Note 4 | 1.55 Note 4 |
| Ês/IotNote3 | | dB | 1,2,3,4,5,6,7,8 | -infinity | 1.55 | 1.55 |
| SS-RSRPNote3 | | dBm/SCS | 1,2,4,5,6,8 | -infinity | -96.45 | -96.45 |
|  | | 3,7 | -infinity | -93.44 | -93.44 |
| IoNote3 | | dBm/9.36 MHz | 1,2,4,5,6,8 | -70.05 | -66.19 | -66.19 |
| dBm/18.36 MHz | 3,7 | -67.13 | -63.27 | -63.27 |
| Propagation condition | |  | 1,2,3,4,5,6,7,8 | AWGN | | |
| Antenna Configuration and Correlation Matrix | |  | 1,2,3,4,5,6,7,8 | 1x2 Low | | |
| NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for *Noc* to be fulfilled.  NOTE 3: Ês/Iot, SS-RSRP, and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  NOTE 4: Including test tolerance given in Annex F. | | | | | | |

18.2.2 RRC connection release with redirection for RedCap

#### 18.2.2.0 Minimum conformance requirements

##### 18.2.2.0.1 Redirection from E-UTRA to FR1 RedCap UE

The RedCap UE shall be capable of performing the RRC connection release with redirection to the target NR cell within Tconnection\_release\_redirect\_NR\_RedCap.

The time delay (Tconnection\_release\_redirect\_NR\_RedCap) 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 NR cell. The time delay (Tconnection\_release\_redirect\_NR\_RedCap) shall be less than:

Tconnection\_release\_redirect\_NR\_RedCap = TRRC\_procedure\_delay + Tidentify-NR\_Redcap + TSI-NR\_RedCap + TRACH\_RedCap

The target NR cell shall be considered detectable for 1 Rx RedCap when for each relevant SSB:

- SSB\_RP and SSB Ês/Iot according to Annex B.2.X of TS 38.133 [6] for a corresponding NR Band.

The target NR cell shall be considered detectable for 2 Rx RedCap when for each relevant SSB:

- SSB\_RP and SSB Ês/Iot according to Annex B.2.X of TS 38.133 [6] for a corresponding NR Band.

TRRC\_procedure\_delay: It is the RRC procedure delay for processing the received message “*RRCConnectionRelease*” as defined in clause 6.2.2 of TS 36.331 [2]. It shall be less than 110 ms.

Tidentify-NR\_RedCap: It is the time to identify the target NR cell and depends on the frequency range (FR) of the target NR cell. It is defined in Table 18.2.2.0-1 for 1 Rx RedCap for FR1 and in Table 18.2.2.0-2 for 2 Rx RedCap. Tidentify-NR\_RedCap = TPSS/SSS-sync\_RedCap + Tmeas\_RedCap, where TPSS/SSS-sync\_RedCap is the cell search time and Tmeas\_RedCap is the measurement time due to cell selection criteria evaluation. The RedCap UE operating in NR HD-FDD shall meet the requirements in this section provided that the SSB is available at the UE at least once every SMTC period during Tidentify-NR\_RedCap.

TSI-NR\_RedCap: It is the time required for acquiring all the relevant system information of the target NR cell. This time depends upon whether the UE is provided with the relevant system information of the target NR cell or not by the old NR cell before the RRC connection is released.

TRACH\_RedCap: It is the delay caused due to the random access procedure when sending random access to the target NR cell. TRACH\_RedCap can be up to the summation of SSB to PRACH occasion association period and 10 ms. SSB to PRACH occasion associated period is defined in the table 8.1-1 of TS 38.213 [39]. The RedCap UE operating in NR HD-FDD mode shall perform the PRACH transmission on the PRACH resource of the target NR cell provided that the UE has received at least one SSB associated with the PRACH resource during the last [TBD] period in the target NR cell.

Trs is the SMTC periodicity of the target NR cell if the UE has been provided with an SMTC configuration for the target cell in the redirection command, otherwise Trs is the SMTC periodicity configured in the *measObjectNR* having the same SSB frequency and subcarrier spacing configured for the RRC connection release with redirection. If the UE is not provided with SMTC configuration or measurement object for the frequency which is also configured for the RRC connection release with redirection then:

- the requirement in this section is applied with Trs = 20 ms assuming the SSB transmission periodicity is not larger than 20 ms,

- there is no requirement if the SSB transmission periodicity is larger than 20 ms.

Table 18.2.2.0-1: Time to identify target NR cell for RRC connection release with redirection to NR for 1 Rx RedCap

|  |  |
| --- | --- |
| Frequency range (FR) of target NR cell | Tidentify-NR\_RedCap |
| FR1 | MAX (680 ms, 12 x Trs) |

Table 18.2.2.0-2: Time to identify target NR cell for RRC connection release with redirection to NR for 2 Rx RedCap

|  |  |
| --- | --- |
| Frequency range (FR) of target NR cell | Tidentify-NR\_RedCap |
| FR1 | MAX (680 ms, 11 x Trs) |
| FR2 | MAX (880 ms, 88 x Trs) |

The normative reference for this requirement is TS 36.133 [23] clause 6.3.2.6.

#### 18.2.2.1 E-UTRA - NR SA FR1 RRC connection release with redirection for 2 Rx UE

18.2.2.1.1 Test purpose

To verify RRC connection release with redirection from E-UTRA to NR requirements for 2Rx RedCap specified in TS 36.133 [23] clause 6.3.2.6.

18.2.2.1.2 Test applicability

This test applies to all types of NR RedCap UE with 2Rx from Release 17 onwards.

18.2.2.1.3 Minimum conformance requirement

The minimum conformance requirements are specified in clause 18.2.2.0.1.

The normative reference for this requirement is TS 38.133 [6] clauses A.18.2.2.1.

18.2.2.1.4 Test description

18.2.2.1.4.1 Initial conditions

This test can be run in the configurations defined in Table 18.2.2.1.4.1-1

Table 18.2.2.1.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.2.2.1-1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode, LTE FDD |
| 18.2.2.1-2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode, LTE FDD |
| 18.2.2.1-3 | NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode, LTE FDD |
| 18.2.2.1-4 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode, LTE TDD |
| 18.2.2.1-5 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode, LTE TDD |
| 18.2.2.1-6 | NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode, LTE TDD |
| 18.2.2.1-7 | NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode, LTE FDD |
| 18.2.2.1-8 | NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode, LTE TDD |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Configure the test equipment and the DUT according to the parameters in Table 18.2.2.1.4.1-2.

Table 18.2.2.1.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 38.508-1 [14] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.4-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 6.3.2.3.2.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in Annex C.2.2. |
| Connection Diagram | TE Part | A.3.1.6.1 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.2.3.2 |
| Exceptions to connection diagram |  | |  |

1. The general test parameters settings are given in Table 18.2.2.1.4.1-3 below.

2. Message contents are defined in clause 18.2.2.1.4.3.

3. There are two cells specified in the test. Cell 1 is the E-UTRA PCell and Cell 2 is the NR neighbour cell. Cell 1 is configured according to TS 36.521-3 [26] Annex C.1.0 and C.1.1, Cell 2 is configured according to Annex C.1.1 and C.1.2,

Table 18.2.2.1.4.1-3: General test parameters for Redirection from E-UTRAN to NR test case

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial conditions | Active cell |  | Cell 1 | E-UTRA Cell |
|  | Neighbouring cell |  | Cell 2 | NR Cell |
| Final condition | Active cell |  | Cell 2 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| Time offset between cells | |  | 3 μs | Synchronous cells |
| T1 | | s | 5 |  |
| T2 | | s | 2.3 |  |

18.2.2.1.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. The *RRCConnectionRelease* message 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.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [25] clause 7.2A.3.

2. Set the parameters according to T1 in Table 18.2.2.1.5-1 for Cell 1 and Table 18.2.2.1.5-2 for Cell 2. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* with *redirectedCarrierInfo* during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 18.2.2.1.5-1 for Cell 1 and in Table 18.2.2.1.5-2 for Cell 2.

6. The UE shall transmit an *RRCSetupRequest* message.

7. If the UE transmits the PRACH to Cell 2 less than 2240 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [25] clause 7.2A.3. Cell 1 is the active cell and Cell 2 shall be powered OFF.

9. The SS shall set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 1008) for next iteration of the test procedure loop.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

18.2.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 18.2.2.1.4.3-1: RRCConnectionRelease (Test procedure, Step 3)

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: 36.508 [25] Table 4.6.1-15 | | | |
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionRelease ::= SEQUENCE { |  |  |  |
| criticalExtensions CHOICE { |  |  |  |
| c1 CHOICE { |  |  |  |
| rrcConnectionRelease-r8 SEQUENCE { |  |  |  |
| redirectedCarrierInfo CHOICE { |  |  |  |
| nr-r15 SEQUENCE { |  |  |  |
| carrierFreq-r15 | ARFCN-ValueNR-r15 of Cell 2 |  |  |
| subcarrierSpacingSSB-r15 | khz15 |  | Config 1,2,4,5,7,8 |
|  | Khz30 |  | Config 3,6 |
| smtc-r15 SEQUENCE { |  |  |  |
| periodicityAndOffset-r15 CHOICE { |  |  |  |
| sf40-r15 | 0 |  |  |
| } |  |  |  |
| ssb-Duration-r15 | sf1 |  |  |
| } |  |  |  |
| } |  |  |  |
| } |  |  |  |
| } |  |  |  |
| } |  |  |  |
| } |  |  |  |
| } |  |  |  |

18.2.2.1.5 Test requirement

Table 18.2.2.1.4.3-1 and Table 18.2.2.1.4.3-2 define the primary level settings for redirection from E-UTRA to NR RedCap test case.

Table 18.2.2.1.5-1: E-UTRA Cell specific test parameters (Cell 1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Configuration | Cell 1 | |
|  |  |  | T1 | T2 |
| RF channel number |  | 1,2,3,4,5,6,7,8 | 2 | |
| Duplex mode |  | 1,2,3,7 | FDD | |
|  |  | 4,5,6,8 | TDD | |
| TDD special subframe configurationNote1 |  | 4,5,6,8 | 6 | |
| TDD uplink-downlink configurationNote1 |  | 4,5,6,8 | 1 | |
| BWchannel | MHz | 1,2,3,4,5,6,7,8 | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | |
| PRACH ConfigurationNote2 |  | 1,2,3,7 | 4 | |
|  | 4,5,6,8 | 53 | |
| PDSCH parameters:  DL Reference Measurement ChannelNote3 |  | 1,2,3,7 | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | |
|  | 4,5,6,8 | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement |  | 1,2,3,7 | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | |
| ChannelNote3 | 4,5,6,8 | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | |
| OCNG PatternsNote3 |  | 1,2,3,7 | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | |
|  | 4,5,6,8 | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | |
| PBCH\_RA |  |  |  | |
| PBCH\_RB |  |  |  | |
| PSS\_RA |  |  |  | |
| SSS\_RA |  |  |  | |
| PCFICH\_RB |  |  |  | |
| PHICH\_RA | dB | 1,2,3,4,5,6,7,8 | 0 | |
| PHICH\_RB |  |  |  | |
| PDCCH\_RA |  |  |  | |
| PDCCH\_RB |  |  |  | |
| PDSCH\_RA |  |  |  | |
| PDSCH\_RB |  |  |  | |
| OCNG\_RANote4 |  |  |  | |
| OCNG\_RBNote4 |  |  |  | |
| NocNote5 | dBm/15kHz | 1,2,3,4,5,6,7,8 | -98 | |
| Ês/Noc | dB | 1,2,3,4,5,6,7,8 | 4 | 4 |
| Ês/IotNote6 | dB | 1,2,3,4,5,6,7,8 | 4 | 4 |
| RSRPNote6 | dBm/15kHz | 1,2,3,4,5,6,7,8 | -94 | -94 |
| SCH\_RPNote6 | dBm/15kHz | 1,2,3,4,5,6,7,8 | -94 | -94 |
| IoNote6 | dBm/9MHz | 1,2,3,4,5,6,7,8 | -64.76 | -64.76 |
| Propagation Condition |  | 1,2,3,4,5,6,7,8 | AWGN | |
| Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [23].  Note 2: PRACH configurations are specified in table 5.7.1-2 and table 5.7.1-3 in TS 36.211 [23].  Note 3: DL RMCs and OCNG patterns are specified in clauses A.3.1 and A.3.2 of TS 36.133 [15] respectively.  Note 4: 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 5: Interference from other cells and noise sources 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 6: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 7: Propagation condition and correlation matrix are defined in clause B.2 in TS 36.101 [25]. | | | | |

Table 18.2.2.1.5-2: NR Cell specific test parameters (Cell 2)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | | Unit | Cell 2 | |
|  | | |  | T1 | T2 |
| RF Channel Number | | |  | 1 | |
| Duplex mode | | Config 1,4 |  | FDD | |
|  | | Config 2,3,5,6 |  | TDD | |
|  | | Config 7,8 |  | HD-FDD | |
| SSB Configuration | | Config 1,2,4,5,7,8 |  | SSB.1 FR1 | |
| Config 3,6 |  | SSB.1 RedCap FR1 | |
| TDD configuration | | Config 1,4,7,8 |  | Not Applicable | |
|  | | Config 2,5 |  | TDDConf.1.1 | |
|  | | Config 3,6 |  | TDDConf.2.1 | |
| BWchannel | | Config 1,2,4,5,7,8 | MHz | 10: NRB,c = 52 | |
|  | | Config 3,6 |  | 20: NRB,c = 51 | |
| BWP BW | | Config 1,2,4,5,7,8 | MHz | 10: NRB,c = 52 | |
|  | | Config 3,6 |  | 20: NRB,c = 51 | |
| DRX Cycle | | | ms | Not Applicable | |
| PDSCH Reference | | Config 1,4,7,8 |  | SR.1.1 FDD | |
| measurement channel | | Config 2,5 |  | SR.1.1 TDD | |
|  | | Config 3,6 |  | SR.2.1 TDD | |
| CORESET Reference | | Config 1,4,7,8 |  | CR.1.1 FDD | |
| Channel | | Config 2,5 |  | CR.1.1 TDD | |
|  | | Config 3,6 |  | CR.2.1 TDD | |
| OCNG Patterns | | |  | OP.1 | |
| SMTC configuration | | Config 1,2,4,5,7,8 |  | SMTC.1 RedCap FR1 | |
|  | | Config 3,6 |  | SMTC.1 RedCap FR1 | |
| PDSCH/PDCCH | | Config 1,2,4,5,7,8 | kHz | 15 kHz | |
| subcarrier spacing | | Config 3,6 |  | 30 kHz | |
| PUCCH/PUSCH | | Config 1,2,4,5,7,8 | kHz | 15 kHz | |
| subcarrier spacing | | Config 3,6 |  | 30 kHz | |
| PRACH configuration | | |  | PRACH.1 FR1 | |
| BWP configuration | | Initial DL BWP |  | DLBWP.0.1 | |
|  | | Dedicated DL BWP |  | DLBWP.1.1 | |
|  | | Initial UL BWP |  | ULBWP.0.1 | |
|  | | Dedicated UL BWP |  | ULBWP.1.1 | |
| EPRE ratio of PSS to SSS | | | dB | 0 | |
| EPRE ratio of PBCH DMRS to SSS | | |  |  | |
| EPRE ratio of PBCH to PBCH DMRS | | |  |  | |
| EPRE ratio of PDCCH DMRS to SSS | | |  |  | |
| EPRE ratio of PDCCH to PDCCH DMRS | | |  |  | |
| EPRE ratio of PDSCH DMRS to SSS | | |  |  | |
| EPRE ratio of PDSCH to PDSCH | | |  |  | |
| EPRE ratio of OCNG DMRS to SSS Note 1 | | |  |  | |
| EPRE ratio of OCNG to OCNG DMRS Note 1 | | |  |  | |
| Note2 | | | dBm/15kHz | -98 | |
| Note2 | Config 1,2,4,5,7,8 | | dBm/SCS | -98 | |
|  | Config 3,6 | |  | -95 | |
|  | | | dB | -infinity | 4 |
|  | | | dB | -infinity | 4 |
| IoNote3 | Config 1,2,4,5,7,8 | | dBm/  9.36MHz | -70.05 | -64.59 |
|  | Config 3,6 | | dBm/  18.36MHz | -67.12 | -61.67 |
| 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  to be fulfilled.  Note 3: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | |

The UE shall start to transmit the PRACH to Cell 2 less than 2240 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to NR observed during repeated tests shall be at least 90%.

NOTE: The redirection delay can be expressed as:

Tconnection\_release\_redirect\_NR\_RedCap = TRRC\_procedure\_delay + Tidentify-NR\_Redcap + TSI-NR\_RedCap + TRACH\_RedCap

where:

TRRC\_procedure\_delay = 110 ms and is specified in clause 12 in TS 38.331 [13].

Tidentify-NR = 680 ms in the test.

TSI-NR\_RedCap = 1280 ms, it is the time required for receiving all the relevant system information as defined in TS 38.331[13] for the target NR cell.

TRACH\_RedCap = 170 ms in the test.

This gives a total of 2240 ms.

## 18.3 Measurement procedure for RedCap

### 18.3.1 E-UTRA - NR Measurements for RedCap

#### 18.3.1.0 Minimum conformance requirements

##### 18.3.1.0.1 Minimum conformance requirements for E-UTRA - NR event-triggered measurement

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

Requirements in this clause are applicable to both E-UTRA FDD and E-UTRA TDD serving cell.

When measurement gaps are scheduled, the RedCap UE shall be able to identify a new detectable cell within Tidentify\_irat\_without\_index\_RedCap if UE is not indicated to report SSB based RRM measurement result with the associated SSB index (*reportQuantityRsIndexes* or *maxNrofRSIndexesToReport* is not configured). Otherwise, UE shall be able to identify a new detectable inter-RAT cell within Tidentify\_irat\_with\_index\_RedCap. The UE shall be able to identify a new detectable inter-RAT SS block of an already detected cell within Tidentify\_irat\_without\_index\_RedCap.

Tidentify\_irat\_without\_index\_RedCap = (TPSS/SSS\_sync\_irat\_RedCap + T SSB\_measurement\_period\_irat\_RedCap) ms

Tidentify\_irat\_with\_index\_RedCap = (TPSS/SSS\_sync\_irat\_RedCap + T SSB\_measurement\_period\_irat\_RedCap + TSSB\_time\_index\_irat\_RedCap) ms

Where:

TPSS/SSS\_sync\_irat\_RedCap: it is the time period used in PSS/SSS detection given in Table 18.3.1.0.1-1 and Table 18.3.1.0.1-3 for 2 Rx RedCap, Table 18.3.1.0.1-2 for 1 Rx RedCap.

TSSB\_time\_index\_irat\_RedCap: it is the time period used to acquire the index of the SSB being measured given in Table 18.3.1.0.1-4 and Table 18.3.1.0.1-6 for 2 Rx RedCap, Table 18.3.1.0.1-5 for 1 Rx RedCap.

TSSB\_measurement\_period\_irat\_RedCap: equal to a measurement period of SSB based measurement given in Table 18.3.1.0.1-7 and Table 18.3.1.0.1-9 for 2 Rx RedCap, Table 18.3.1.0.1-8 for 1 Rx RedCap.

Mpss/sss\_sync\_irat\_RedCap: For a 2 Rx RedCap supporting FR2 power class 7, Mpss/sss\_sync\_irat\_RedCap = 40 samples.

MSSB\_index\_irat\_RedCap: For a 2 Rx RedCap supporting FR2 power class 7, MSSB\_index\_irat\_RedCap = 40 samples.

Mmeas\_period\_irat\_RedCap: For a 2 Rx RedCap supporting FR2 power class 7, Mmeas\_period\_irat = 40 samples.

Nfreq\_RedCap is defined in 38.133 [6] clause 8.1.2.1.1d.

Table 18.3.1.0.1-1: Time period for PSS/SSS detection for 2 Rx RedCap (Frequency range FR1)

|  |  |
| --- | --- |
| Condition NOTE1 | TPSS/SSS\_sync\_irat\_RedCap |
| No DRX | Max(600ms, 8 × Max(MGRP, SMTC period)) × Nfreq\_RedCap |
| DRX cycle ≤ 320ms | Max(600ms, Ceil(8×1.5) × Max(MGRP, SMTC period, DRX cycle)) × Nfreq\_RedCap |
| DRX cycle > 320ms | 8 × DRX cycle × Nfreq\_RedCap |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in section 3.6.1 of TS 38.133 [50]. | |

Table 18.3.1.0.1-2: Time period for PSS/SSS detection for 1 Rx RedCap (Frequency range FR1)

|  |  |
| --- | --- |
| Condition NOTE1 | TPSS/SSS\_sync\_irat\_RedCap |
| No DRX | Max(600ms, 7 × Max(MGRP, SMTC period)) × Nfreq\_RedCap |
| DRX cycle ≤ 320ms | Max(600ms, Ceil(7 \*1.5) × Max(MGRP, SMTC period, DRX cycle)) × Nfreq\_RedCap |
| DRX cycle > 320ms | 7 × DRX cycle × Nfreq\_RedCap |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in section 3.6.1 of TS 38.133 [50]. | |

Table 18.3.1.0.1-3: Time period for PSS/SSS detection for 2 Rx RedCap (Frequency range FR2)

|  |  |
| --- | --- |
| **Condition NOTE1** | **TPSS/SSS\_sync\_irat\_RedCap** |
| No DRX | Max(600ms, Mpss/sss\_sync\_irat\_RedCap × Max(MGRP, SMTC period)) × Nfreq\_RedCap |
| DRX cycle ≤ 320ms | Max(600ms, (1.5 × Mpss/sss\_sync\_irat\_RedCap) × Max(MGRP, SMTC period, DRX cycle)) × Nfreq\_RedCap |
| DRX cycle > 320ms | Mpss/sss\_sync\_irat\_RedCap × DRX cycle × Nfreq\_RedCap |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in section 3.6.1 of TS 38.133 [50]. | |

Table 18.3.1.0.1-4: Time period for time index detection for 2 Rx RedCap (Frequency range FR1)

|  |  |
| --- | --- |
| Condition NOTE1 | TSSB\_time\_index\_irat\_RedCap |
| No DRX | Max(120ms, 3 × Max(MGRP, SMTC period)) × Nfreq\_RedCap |
| DRX cycle ≤ 320ms | Max(120ms, Ceil(3 × 1.5) × Max(MGRP, SMTC period, DRX cycle)) × Nfreq\_RedCap |
| DRX cycle > 320ms | 3 × DRX cycle × Nfreq\_RedCap |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in section 3.6.1 of TS 38.133 [50]. | |

Table 18.3.1.0.1-5: Time period for time index detection for 1 Rx RedCap (Frequency range FR1)

|  |  |
| --- | --- |
| Condition NOTE1 | TSSB\_time\_index\_irat\_RedCap |
| No DRX | Max(160ms, 6 × Max(MGRP, SMTC period)) × Nfreq\_RedCap |
| DRX cycle ≤ 320ms | Max(160ms, Ceil(6 × 1.5) × Max(MGRP, SMTC period, DRX cycle)) × Nfreq\_RedCap |
| DRX cycle > 320ms | 6 × DRX cycle × Nfreq\_RedCap |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in section 3.6.1 of TS 38.133 [50]. | |

Table 18.3.1.0.1-6: Time period for time index detection for 2 Rx RedCap (Frequency range FR2)

|  |  |
| --- | --- |
| Condition NOTE1 | TSSB\_time\_index\_irat\_RedCap |
| No DRX | Max(200ms, MSSB\_index\_irat\_RedCap × Max(MGRP, SMTC period)) × Nfreq\_RedCap |
| DRX cycle ≤ 320ms | Max(200ms, (1.5 × MSSB\_index\_irat\_RedCap) × Max(MGRP, SMTC period, DRX cycle)) × Nfreq\_RedCap |
| DRX cycle > 320ms | MSSB\_index\_irat\_RedCap × DRX cycle × Nfreq\_RedCap |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in section 3.6.1 of TS 38.133 [50]. | |

In the requirements, an NR cell is considered detectable when:

- NR SS-RSRP related conditions in the accuracy requirements in Section 9.11.x are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 of TS 38.133 [50],

- NR SS-RSRQ related conditions in the accuracy requirements in Section 9.11.y are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 of TS 38.133 [50],

- NR SS-SINR related conditions in the accuracy requirements in Section 9.11.z are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 of TS 38.133 [50].

The RedCap UE operating in NR HD-FDD shall meet the current PSS/SSS detection requirements provided that at least 5 SMTC windows are available at the UE during the PSS/SSS detection time.

The RedCap UE operating in NR HD-FDD shall meet the current time index detection requirements provided that at least 3 SMTC windows are available at the UE during the time index detection time.

When measurement gaps are scheduled for NR measurements the UE physical layer shall be capable of reporting NR SS-RSRP, SS-RSRQ and SS-SINR measurements to higher layers with measurement accuracy as specified in clause 9.11, with measurement period as shown in table 8.20.2.1-5 and 8.20.2.1-6 for 2Rx UE, table 8.20.2.1-5a for 1Rx UE:

Table 8.20.2.1-5: Measurement period for inter-RAT measurements for 2 Rx RedCap (Frequency range FR1)

|  |  |
| --- | --- |
| Condition NOTE1 | TSSB\_measurement\_period\_irat\_RedCap |
| No DRX | Max(200ms, 8 × Max(MGRP, SMTC period)) × Nfreq\_RedCap |
| DRX cycle ≤ 320ms | Max(200ms, Ceil(8 × 1.5) × Max(MGRP, SMTC period, DRX cycle)) × Nfreq\_RedCap |
| DRX cycle > 320ms | 8 × DRX cycle × Nfreq\_RedCap |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in section 3.6.1 of TS 38.133 [50]. | |

Table 8.20.2.1-5a: Measurement period for inter-RAT measurements for 1 Rx RedCap (Frequency range FR1)

|  |  |
| --- | --- |
| Condition NOTE1 | TSSB\_measurement\_period\_irat\_RedCap |
| No DRX | Max(200ms, 8 × Max(MGRP, SMTC period)) × Nfreq\_RedCap |
| DRX cycle ≤ 320ms | Max(200ms, Ceil(8 × 1.5) × Max(MGRP, SMTC period, DRX cycle)) × Nfreq\_RedCap |
| DRX cycle > 320ms | 8 × DRX cycle × Nfreq\_RedCap |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in section 3.6.1 of TS 38.133 [50]. | |

Table 8.20.2.1-6: Measurement period for inter-RAT measurements for 2 Rx RedCap (Frequency range FR2)

|  |  |
| --- | --- |
| Condition NOTE1 | TSSB\_measurement\_period\_irat\_RedCap |
| No DRX | Max(400ms, Mmeas\_period\_irat\_RedCap × Max(MGRP, SMTC period)) × Nfreq\_RedCap |
| DRX cycle ≤ 320ms | Max(400ms, (1.5 × Mmeas\_period\_irat\_RedCap) × Max(MGRP, SMTC period, DRX cycle)) × Nfreq\_RedCap |
| DRX cycle > 320ms | Mmeas\_period\_irat\_RedCap × DRX cycle × Nfreq\_RedCap |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in section 3.6.1 of TS 38.133 [50]. | |

The RedCap UE operating in NR HD-FDD shall meet the current measurement requirements provided that at least 5 SMTC windows are available at the UE during the measurement period.

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 are 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 Tidentify\_irat\_without\_index\_RedCap or Tidentify\_irat\_with\_index\_RedCap for the minimum requirements.

If an NR cell which has been detectable at least for the time period Tidentify\_irat\_without\_index\_RedCap. or Tidentify\_irat\_with\_index\_RedCap defined in clause 8.20.2.1 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 TSSB\_measurement\_period\_irat\_RedCap defined in clause 8.20.2.1 provided the timing to that cell has not changed more than ±3200 Tc while measurement gap has not been available and the L3 filter has not been used.

#### 18.3.1.1 E-UTRA - NR SA FR1 event triggered reporting without SSB time index detection in non-DRX

18.3.1.1.1 Test purpose

To verify that the RedCap UE makes correct reporting of an event. This test will partly verify the NR inter-RAT cell search requirements in clause TS 36.133 [23] clause 8.20.2 for E-UTRAN FDD-NR measurements and TS 36.133 [23] clause 8.20.3 for E-UTRAN TDD-NR measurements.

18.3.1.1.2 Test applicability

This test applies to all E-UTRA UE from release 17 onwards and capable of NR RedCap with 2Rx.

18.3.1.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 18.3.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.18.3.1.1.

18.3.1.1.4 Test description

Same as the test description given in clause 8.4.2.1.4.

18.3.1.1.4.1 Initial conditions

Same as the initial conditions given in clause 8.4.2.1.4.1 with following exceptions:

- Table 8.4.2.1.4.1-1 is replaced by Table 18.3.1.1.4.1-1.

- Table 8.4.2.1.4.1-2 is replaced by Table 18.3.1.1.4.1-2.

- Table 8.4.2.1.4.1-3 is replaced by Table 18.3.1.1.4.1-3.

Table 18.3.1.1.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.3.1.1-1 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.3.1.1-2 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.3.1.1-3 | LTE FDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.3.1.1-4 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.3.1.1-5 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.3.1.1-6 | LTE TDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.3.1.1-7 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| 18.3.1.1-8 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations. | |

Table 18.3.1.1.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 36.508 [25] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.16-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 18.3.1.1.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in clause C.2.2 |
| Connection Diagram | TE Part | A.3.1.8.2 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.2.3.4 |
| Exceptions to connection diagram | N/A | |  |

Table 18.3.1.1.4.1-3: General test parameters for NR inter-RAT event triggered reporting for FR1 without SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Test 1 |
| E-UTRA RF Channel Numbers | |  | 1 | One E-UTRA carrier frequency is used. |
| NR RF Chanel Number | |  | 1 | One FR1 NR carrier frequency is used. |
| Active cell | |  | E-UTRA cell 1 | E-UTRA cell 1 is on E-UTRA RF channel number 1. |
| Neighbour cell | |  | NR cell 2 | NR cell 2 is on NR RF channel number 1. |
| Gap Pattern Id | |  | 0 | As specified in Table 8.1.2.1-1 of TS 36.133 [23]. |
| Measurement gap offset | |  | 39 | As specified in TS 36.331 [29]. |
| Hysteresis | | dB | 0 |  |
| CP length | |  | Normal |  |
| TimeToTrigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  | OFF | DRX is not used |
| Time offset between serving and neighbour cells | Config 1,4,7,8 |  | 3ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| Config 2,3,5,6 |  | 3μs | Synchronous cells. |
| T1 | | s | 5 |  |
| T2 | | s | 1 |  |

18.3.1.1.4.2 Test procedure

Same as the test procedure given in clause 8.4.2.1.4.2.

18.3.1.1.4.3 Message contents

Same as the message contents given in clause 8.4.2.1.4.3 with following exceptions:

- The specific message contents exceptions for test configuration 8.4.2.1-1 and 8.4.2.1-4 also apply to test configuration 18.3.1.1-7 and 18.3.1.1-8.

- Condition SSB.2 FR1 is replaced by SSB.1 RedCap FR1

- Table 8.4.2.1.4.3-2 is replaced by Table 18.3.1.1.4.3-1.

Table 18.3.1.1.4.3-1: SchedulingRequest-Config-DEFAULT

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [25] Table 4.6.3-20 | | | |
| Information Element | Value/remark | Comment | Condition |
| SchedulingRequest-Config-DEFAULT ::= CHOICE { |  |  |  |
| setup SEQUENCE { |  |  |  |
| sr-ConfigIndex | 25 |  | Config 18.3.1.1-1/2/3/7 |
|  | 22 |  | Config 18.3.1.1-4/5/6/8 |
| } |  |  |  |
| } |  |  |  |

18.3.1.1.5 Test requirement

Same as the test requirements given in clause 8.4.2.1.5 with following exceptions:

- Table 8.4.2.1.5-1 is replaced by Table 18.3.1.1.5-1.

- Table 8.4.2.1.5-2 is replaced by Table 18.3.1.1.5-2.

Table 18.3.1.1.5-1: E-UTRAN PCell specific test parameters for NR inter-RAT event triggered reporting in non-DRX with NR neigbour cell in FR1 without SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 1 | |
| T1 | T2 |
| RF channel number | |  | 1 | |
| Duplex mode | Config 1,2,3,7 |  | FDD | |
| Config 4,5,6,8 |  | TDD | |
| TDD special subframe configurationNote1 | Config 4,5,6,8 |  | 6 | |
| TDD uplink-downlink configurationNote1 | Config 4,5,6,8 |  | 1 | |
| BWchannel | | MHz | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | |
| PDSCH parameters:  DL Reference Measurement ChannelNote2 | Config 1,2,3,7 |  | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | |
| Config 4,5,6,8 |  | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote2 | Config 1,2,3,7 |  | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | |
| Config 4,5,6,8 |  | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | |
| OCNG PatternsNote2 | Config 1,2,3,7 |  | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | |
| Config 4,5,6,8 |  | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | |
| b2-Threshold1 | | dBm | -77 | |
| PBCH\_RA | | dB | 0 | |
| PBCH\_RB | |
| PSS\_RA | |
| SSS\_RA | |
| PCFICH\_RB | |
| PHICH\_RA | |
| PHICH\_RB | |
| PDCCH\_RA | |
| PDCCH\_RB | |
| PDSCH\_RA | |
| PDSCH\_RB | |
| OCNG\_RANote3 | |
| OCNG\_RBNote3 | |
| NocNote4 | | dBm/15 kHz | -104 | |
| Ês/Noc | | dB | 17 | 17 |
| Ês/IotNote5 | | dB | 17 | 17 |
| RSRPNote5 | | dBm/15 kHz | -87 | -87 |
| SCH\_RPNote5 | | dBm/15 kHz | -87 | -87 |
| IoNote5 | | dBm/ 9 MHz | -56.12 | -56.12 |
| Propagation Condition Note6 | |  | AWGN | |
| Antenna Configuration and Correlation Matrix Note6 | |  | 1x2 | |
| Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [24].  Note 2: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [23] respectively.  Note 3: 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: Interference from other cells and noise sources 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 5: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 6: Propagation condition and correlation matrix are defined in clause B.2 in TS 36.101 [27]. | | | | |

Table 18.3.1.1.5-2: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR1 without SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | |
| T1 | T2 |
| NR RF Channel Number | |  | 1 | |
| Duplex mode | Config 1,4 |  | FDD | |
| Config 2,3,5,6 | TDD | |
| Config 7,8 | HD-FDD | |
| TDD configuration | Config 2,5 |  | TDDConf.1.1 | |
| Config 3,6 | TDDConf.2.1 | |
| BWchannel | Config 1,2,4,5,7,8 | MHz | 10: NRB,c = 52 | |
| Config 3,6 | 20: NRB,c = 51 | |
| OCNG Patterns | |  | OP.1 | |
| SMTC configuration | Config 1,4,7,8 |  | SMTC.2 | |
| Config 2,3,5,6 | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | Config 1,2,4,5,7,8 | kHz | 15 | |
| Config 3,6 | 30 | |
| b2-Threshold2NR | Config 1,2,4,5,7,8 | dBm/SCS | -101 | |
| Config 3,6 | -98 | |
| EPRE ratio of PSS to SSS | | dB | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |
| EPRE ratio of PBCH to PBCH DMRS | |
| EPRE ratio of PDCCH DMRS to SSS | |
| EPRE ratio of PDCCH to PDCCH DMRS | |
| EPRE ratio of PDSCH DMRS to SSS | |
| EPRE ratio of PDSCH to PDSCH | |
| EPRE ratio of OCNG DMRS to SSS Note 1 | |
| EPRE ratio of OCNG to OCNG DMRS Note 1 | |
| Note2 | | dBm/15kHz | -98 | |
| Note2 | Config 1,2,4,5,7,8 | dBm/SCS | -98 | |
| Config 3,6 | -95 | |
| SS-RSRP Note 3 | Config 1,2,4,5,7,8 | dBm/SCS | -Infinity | -91 |
| Config 3,6 | -Infinity | -88 |
|  | | dB | -Infinity | 7 |
|  | | dB | -Infinity | 7 |
| IoNote3 | Config 1,2,4,5,7,8 | dBm/9.36MHz | -70.05 | -62.26 |
| Config 3,6 | dBm/18.36MHz | -67.12 | -59.33 |
| Propagation Condition | |  | AWGN | |
| Antenna Configuration and Correlation Matrix | |  | 1x2 | |
| Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | |

#### 18.3.1.2 E-UTRA - NR SA FR1 event triggered reporting without SSB time index detection in DRX

18.3.1.2.1 Test purpose

To verify that the RedCap UE makes correct reporting of an event. This test will partly verify the NR inter-RAT cell search requirements in clause TS 36.133 [23] clause 8.20.2 for E-UTRAN FDD-NR measurements and TS 36.133 [23] clause 8.20.3 for E-UTRAN TDD-NR measurements.

18.3.1.2.2 Test applicability

This test applies to all E-UTRA UE from release 17 onwards supporting NR RedCap with 2Rx and long DRX cycle.

18.3.1.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 18.3.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.18.3.1.2.

18.3.1.2.4 Test description

Same as the test description given in clause 8.4.2.2.4.

18.3.1.2.4.1 Initial conditions

Same as the initial conditions given in clause 8.4.2.2.4.1 with following exceptions:

- Table 8.4.2.2.4.1-1 is replaced by Table 18.3.1.2.4.1-1.

- Table 8.4.2.2.4.1-2 is replaced by Table 18.3.1.2.4.1-2.

- Table 8.4.2.2.4.1-3 is replaced by Table 18.3.1.2.4.1-3.

Table 18.3.1.2.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.3.1.2-1 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.3.1.2-2 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.3.1.2-3 | LTE FDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.3.1.2-4 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.3.1.2-5 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.3.1.2-6 | LTE TDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.3.1.2-7 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| 18.3.1.2-8 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations. | |

Table 18.3.1.2.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 36.508 [25] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.16-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 18.3.1.2.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in clause C.2.2 |
| Connection Diagram | TE Part | A.3.1.8.2 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.2.3.4 |
| Exceptions to connection diagram | N/A | |  |

Table 18.3.1.2.4.1-3: General test parameters for NR inter-RAT event triggered reporting for FR1 without SSB time index detection

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | | Comment |
| Test 1 | Test 2 |
| E-UTRA RF Channel Numbers | |  | 1 | | One E-UTRA carrier frequency is used. |
| NR RF Channel Number | |  | 1 | | One FR1 NR carrier frequency is used. |
| Active cell | |  | E-UTRA Cell 1 | | E-UTRA cell 1 is on E-UTRA RF channel number 1. |
| Neighbour cell | |  | NR Cell 2 | | NR cell 2 is on NR RF channel number 1. |
| Gap Pattern Id | |  | 0 | | As specified in TS 36.133 [23] Table 8.1.2.1-1. |
| Measurement gap offset | |  | 39 | | As specified in TS 36.331 [29]. |
| Hysteresis | | dB | 0 | |  |
| CP length | |  | Normal | |  |
| TimeToTrigger | | s | 0 | |  |
| Filter coefficient | |  | 0 | | L3 filtering is not used |
| DRX | |  | DRX.9 | DRX.12 | As specified in clause A.5 |
| Time offset between serving and neighbour cells | Config 1,4,7,8 |  | 3ms | | Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| Config 2,3,5,6 |  | 3μs | | Synchronous cells. |
| T1 | | s | 5 | |  |
| T2 | | s | 2 | 11 |  |

18.3.1.2.4.2 Test procedure

Same as the test procedure given in clause 8.4.2.2.4.2.

18.3.1.2.4.3 Message contents

Same as the message contents given in clause 8.4.2.2.4.3 with following exceptions:

- The specific message contents exceptions for test configuration 8.4.2.2-1 and 8.4.2.2-4 also apply to test configuration 18.3.1.2-7 and 18.3.1.2-8.

- Condition SSB.2 FR1 is replaced by SSB.1 RedCap FR1

- Table 8.4.2.2.4.3-2 is replaced by Table 18.3.1.2.4.3-1.

Table 18.3.1.2.4.3-1: SchedulingRequest-Config-DEFAULT

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [25] Table 4.6.3-20 | | | |
| Information Element | Value/remark | Comment | Condition |
| SchedulingRequest-Config-DEFAULT ::= CHOICE { |  |  |  |
| setup SEQUENCE { |  |  |  |
| sr-ConfigIndex | 25 |  | Config 18.3.1.2-1/2/3/7 |
|  | 22 |  | Config 18.3.1.2-4/5/6/8 |
| } |  |  |  |
| } |  |  |  |

18.3.1.2.5 Test requirement

Same as the test requirements given in clause 8.4.2.2.5 with following exceptions:

- Table 8.4.2.2.5-1 is replaced by Table 18.3.1.2.5-1.

- Table 8.4.2.2.5-2 is replaced by Table 18.3.1.2.5-2.

Table 18.3.1.2.5-1: E-UTRAN PCell specific test parameters for NR inter-RAT event triggered reporting in DRX with NR neigbour cell in FR1 without SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 1 | |
| T1 | T2 |
| RF channel number | |  | 1 | |
| Duplex mode | Config 1,2,3,7 |  | FDD | |
| Config 4,5,6,8 |  | TDD | |
| TDD special subframe configurationNote1 | Config 4,5,6,8 |  | 6 | |
| TDD uplink-downlink configurationNote1 | Config 4,5,6,8 |  | 1 | |
| BWchannel | | MHz | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | |
| PDSCH parameters:  DL Reference Measurement ChannelNote2 | Config 1,2,3,7 |  | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | |
| Config 4,5,6,8 |  | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote2 | Config 1,2,3,7 |  | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | |
| Config 4,5,6,8 |  | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | |
| OCNG PatternsNote2 | Config 1,2,3,7 |  | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | |
| Config 4,5,6,8 |  | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | |
| b2-Threshold1 | | dBm | -77 | |
| PBCH\_RA | | dB | 0 | |
| PBCH\_RB | |
| PSS\_RA | |
| SSS\_RA | |
| PCFICH\_RB | |
| PHICH\_RA | |
| PHICH\_RB | |
| PDCCH\_RA | |
| PDCCH\_RB | |
| PDSCH\_RA | |
| PDSCH\_RB | |
| OCNG\_RANote3 | |
| OCNG\_RBNote3 | |
| NocNote4 | | dBm/15 kHz | -104 | |
| Ês/Noc | | dB | 17 | 17 |
| Ês/IotNote5 | | dB | 17 | 17 |
| RSRPNote5 | | dBm/15 kHz | -87 | -87 |
| SCH\_RPNote5 | | dBm/15 kHz | -87 | -87 |
| IoNote5 | | dBm/ 9 MHz | -56.12 | -56.12 |
| Propagation Condition Note6 | |  | AWGN | |
| Antenna Configuration and Correlation Matrix Note6 | |  | 1x2 | |
| Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [24].  Note 2: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [23] respectively.  Note 3: 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: Interference from other cells and noise sources 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 5: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 6: Propagation condition and correlation matrix are defined in clause B.2 in TS 36.101 [27]. | | | | |

Table 18.3.1.2.5-2: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR1 without SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | |
| T1 | T2 |
| NR RF Channel Number | |  | 1 | |
| Duplex mode | Config 1,4 |  | FDD | |
| Config 2,3,5,6 | TDD | |
| Config 7,8 | HD-FDD | |
| TDD configuration | Config 2,5 |  | TDDConf.1.1 | |
| Config 3,6 | TDDConf.2.1 | |
| BWchannel | Config 1,2,4,5,7,8 | MHz | 10: NRB,c = 52 | |
| Config 3,6 | 20: NRB,c = 51 | |
| OCNG Patterns | |  | OP.1 | |
| SMTC configuration | Config 1,4,7,8 |  | SMTC.2 | |
| Config 2,3,5,6 | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | Config 1,2,4,5,7,8 | kHz | 15 | |
| Config 3,6 | 30 | |
| b2-Threshold2NR | Config 1,2,4,5,7,8 | dBm/SCS | -101 | |
| Config 3,6 | -98 | |
| EPRE ratio of PSS to SSS | | dB | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |
| EPRE ratio of PBCH to PBCH DMRS | |
| EPRE ratio of PDCCH DMRS to SSS | |
| EPRE ratio of PDCCH to PDCCH DMRS | |
| EPRE ratio of PDSCH DMRS to SSS | |
| EPRE ratio of PDSCH to PDSCH | |
| EPRE ratio of OCNG DMRS to SSS Note 1 | |
| EPRE ratio of OCNG to OCNG DMRS Note 1 | |
| Note2 | | dBm/15kHz | -98 | |
| Note2 | Config 1,2,4,5,7,8 | dBm/SCS | -98 | |
| Config 3,6 | -95 | |
| SS-RSRP Note 3 | Config 1,2,4,5,7,8 | dBm/SCS | -Infinity | -91 |
| Config 3,6 | -Infinity | -88 |
|  | | dB | -Infinity | 7 |
|  | | dB | -Infinity | 7 |
| IoNote3 | Config 1,2,4,5,7,8 | dBm/9.36MHz | -70.05 | -62.26 |
| Config 3,6 | dBm/18.36MHz | -67.12 | -59.33 |
| Propagation Condition | |  | AWGN | |
| Antenna Configuration and Correlation Matrix | |  | 1x2 | |
| NOTE 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  NOTE 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  NOTE 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | |

#### 18.3.1.3 E-UTRA - NR SA FR1 event triggered reporting with SSB time index detection in non-DRX

18.3.1.3.1 Test purpose

To verify that the RedCap UE makes correct reporting of an event. This test will partly verify the NR inter-RAT cell search requirements in clause TS 36.133 [23] clause 8.20.2 for E-UTRAN FDD-NR measurements and TS 36.133 [23] clause 8.20.3 for E-UTRAN TDD-NR measurements.

18.3.1.3.2 Test applicability

This test applies to all E-UTRA UE from release 17 onwards and capable of NR RedCap with 2Rx.

18.3.1.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 18.3.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.18.3.1.3.

18.3.1.3.4 Test description

Same as the test description given in clause 8.4.2.3.4.

18.3.1.3.4.1 Initial conditions

Same as the initial conditions given in clause 8.4.2.3.4.1 with following exceptions:

- Table 8.4.2.3.4.1-1 is replaced by Table 18.3.1.3.4.1-1.

- Table 8.4.2.3.4.1-2 is replaced by Table 18.3.1.3.4.1-2.

- Table 8.4.2.3.4.1-3 is replaced by Table 18.3.1.3.4.1-3.

Table 18.3.1.3.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.3.1.3-1 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.3.1.3-2 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.3.1.3-3 | LTE FDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.3.1.3-4 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.3.1.3-5 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.3.1.3-6 | LTE TDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.3.1.3-7 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| 18.3.1.3-8 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations. | |

Table 18.3.1.3.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 36.508 [25] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.16-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 18.3.1.3.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in clause C.2.2 |
| Connection Diagram | TE Part | A.3.1.8.2 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.2.3.4 |
| Exceptions to connection diagram | N/A | |  |

Table 18.3.1.3.4.1-3: General test parameters for NR inter-RAT event triggered reporting for FR1 with SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Test 1 |
| E-UTRA RF Channel Numbers | |  | 1 | One E-UTRA carrier frequency is used. |
| NR RF Chanel Number | |  | 1 | One FR1 NR carrier frequency is used. |
| Active cell | |  | E-UTRA cell 1 | E-UTRA cell 1 is on E-UTRA RF channel number 1. |
| Neighbour cell | |  | NR cell 2 | NR cell 2 is on NR RF channel number 1. |
| Gap Pattern Id | |  | 0 | As specified in Table 8.1.2.1-1 of TS 36.133 [23]. |
| Measurement gap offset | |  | 39 | As specified in TS 36.331 [29]. |
| Hysteresis | | dB | 0 |  |
| CP length | |  | Normal |  |
| TimeToTrigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  | OFF | DRX is not used |
| Time offset between serving and neighbour cells | Config 1,4,7,8 |  | 3ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| Config 2,3,5,6 |  | 3μs | Synchronous cells. |
| T1 | | s | 5 |  |
| T2 | | s | 2 |  |

18.3.1.3.4.2 Test procedure

Same as the test procedure given in clause 8.4.2.3.4.2.

18.3.1.3.4.3 Message contents

Same as the message contents given in clause 8.4.2.3.4.3 with following exceptions:

- The specific message contents exceptions for test configuration 8.4.2.3-1 and 8.4.2.3-4 also apply to test configuration 18.3.1.3-7 and 18.3.1.3-8.

- Condition SSB.2 FR1 is replaced by SSB.1 RedCap FR1

- Table 8.4.2.3.4.3-2 is replaced by Table 18.3.1.3.4.3-1.

Table 18.3.1.3.4.3-1: SchedulingRequest-Config-DEFAULT

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [25] Table 4.6.3-20 | | | |
| Information Element | Value/remark | Comment | Condition |
| SchedulingRequest-Config-DEFAULT ::= CHOICE { |  |  |  |
| setup SEQUENCE { |  |  |  |
| sr-ConfigIndex | 25 |  | Config 18.3.1.3-1/2/3/7 |
|  | 22 |  | Config 18.3.1.3-4/5/6/8 |
| } |  |  |  |
| } |  |  |  |

18.3.1.3.5 Test requirement

Same as the test requirements given in clause 8.4.2.3.5 with following exceptions:

- Table 8.4.2.3.5-1 is replaced by Table 18.3.1.3.5-1.

- Table 8.4.2.3.5-2 is replaced by Table 18.3.1.3.5-2.

Table 18.3.1.3.5-1: E-UTRAN PCell specific test parameters for NR inter-RAT event triggered reporting in non-DRX with NR neigbour cell in FR1 with SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 1 | |
| T1 | T2 |
| RF channel number | |  | 1 | |
| Duplex mode | Config 1,2,3,7 |  | FDD | |
| Config 4,5,6,8 |  | TDD | |
| TDD special subframe configurationNote1 | Config 4,5,6,8 |  | 6 | |
| TDD uplink-downlink configurationNote1 | Config 4,5,6,8 |  | 1 | |
| BWchannel | | MHz | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | |
| PDSCH parameters:  DL Reference Measurement ChannelNote2 | Config 1,2,3,7 |  | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | |
| Config 4,5,6,8 |  | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote2 | Config 1,2,3,7 |  | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | |
| Config 4,5,6,8 |  | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | |
| OCNG PatternsNote2 | Config 1,2,3,7 |  | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | |
| Config 4,5,6,8 |  | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | |
| b2-Threshold1 | | dBm | -77 | |
| PBCH\_RA | | dB | 0 | |
| PBCH\_RB | |
| PSS\_RA | |
| SSS\_RA | |
| PCFICH\_RB | |
| PHICH\_RA | |
| PHICH\_RB | |
| PDCCH\_RA | |
| PDCCH\_RB | |
| PDSCH\_RA | |
| PDSCH\_RB | |
| OCNG\_RANote3 | |
| OCNG\_RBNote3 | |
| NocNote4 | | dBm/15 kHz | -104 | |
| Ês/Noc | | dB | 17 | 17 |
| Ês/IotNote5 | | dB | 17 | 17 |
| RSRPNote5 | | dBm/15 kHz | -87 | -87 |
| SCH\_RPNote5 | | dBm/15 kHz | -87 | -87 |
| IoNote5 | | dBm/ 9 MHz | -56.12 | -56.12 |
| Propagation Condition Note6 | |  | AWGN | |
| Antenna Configuration and Correlation Matrix Note6 | |  | 1x2 | |
| Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [24].  Note 2: DL RMCs and OCNG patterns are specified in clauses A.3.1 and A.3.2 of TS 36.133 [23] respectively.  Note 3: 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: Interference from other cells and noise sources 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 5: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 6: Propagation condition and correlation matrix are defined in clause B.2 in TS 36.101 [27]. | | | | |

Table 18.3.1.3.5-2: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR1 with SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | |
| T1 | T2 |
| NR RF Channel Number | |  | 1 | |
| Duplex mode | Config 1,4 |  | FDD | |
| Config 2,3,5,6 | TDD | |
| Config 7,8 | HD-FDD | |
| TDD configuration | Config 2,5 |  | TDDConf.1.1 | |
| Config 3,6 | TDDConf.2.1 | |
| BWchannel | Config 1,2,4,5,7,8 | MHz | 10: NRB,c = 52 | |
| Config 3,6 | 20: NRB,c = 51 | |
| OCNG Patterns | |  | OP.1 | |
| SMTC configuration | Config 1,4,7,8 |  | SMTC.2 | |
| Config 2,3,5,6 | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | Config 1,2,4,5,7,8 | kHz | 15 | |
| Config 3,6 | 30 | |
| b2-Threshold2NR | Config 1,2,4,5,7,8 | dBm/SCS | -101 | |
| Config 3,6 | -98 | |
| EPRE ratio of PSS to SSS | | dB | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |
| EPRE ratio of PBCH to PBCH DMRS | |
| EPRE ratio of PDCCH DMRS to SSS | |
| EPRE ratio of PDCCH to PDCCH DMRS | |
| EPRE ratio of PDSCH DMRS to SSS | |
| EPRE ratio of PDSCH to PDSCH | |
| EPRE ratio of OCNG DMRS to SSS Note 1 | |
| EPRE ratio of OCNG to OCNG DMRS Note 1 | |
| Note2 | | dBm/15kHz | -98 | |
| Note2 | Config 1,2,4,5,7,8 | dBm/SCS | -98 | |
| Config 3,6 | -95 | |
| SS-RSRP Note 3 | Config 1,2,4,5,7,8 | dBm/SCS | -Infinity | -91 |
| Config 3,6 | -Infinity | -88 |
|  | | dB | -Infinity | 7 |
|  | | dB | -Infinity | 7 |
| IoNote3 | Config 1,2,4,5,7,8 | dBm/9.36MHz | -70.05 | -62.26 |
| Config 3,6 | dBm/18.36MHz | -67.12 | -59.33 |
| Propagation Condition | |  | AWGN | |
| Antenna Configuration and Correlation Matrix | |  | 1x2 | |
| Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | |

#### 18.3.1.4 E-UTRA - NR SA FR1 event triggered reporting with SSB time index detection in DRX

18.3.1.4.1 Test purpose

To verify that the RedCap UE makes correct reporting of an event. This test will partly verify the NR inter-RAT cell search requirements in clause TS 36.133 [23] clause 8.20.2 for E-UTRAN FDD-NR measurements and TS 36.133 [23] clause 8.20.3 for E-UTRAN TDD-NR measurements.

18.3.1.4.2 Test applicability

This test applies to all E-UTRA UE from release 17 onwards supporting NR RedCap with 2Rx and long DRX cycle.

18.3.1.4.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 18.3.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.18.3.1.4.

18.3.1.4.4 Test description

Same as the test description given in clause 8.4.2.4.4.

18.3.1.4.4.1 Initial conditions

Same as the initial conditions given in clause 8.4.2.4.4.1 with following exceptions:

- Table 8.4.2.4.4.1-1 is replaced by Table 18.3.1.4.4.1-1.

- Table 8.4.2.4.4.1-2 is replaced by Table 18.3.1.4.4.1-2.

- Table 8.4.2.4.4.1-3 is replaced by Table 18.3.1.4.4.1-3.

Table 18.3.1.4.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.3.1.4-1 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.3.1.4-2 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.3.1.4-3 | LTE FDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.3.1.4-4 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 18.3.1.4-5 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 18.3.1.4-6 | LTE TDD, NR 30 kHz SSB SCS, 20 MHz bandwidth, TDD duplex mode |
| 18.3.1.4-7 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| 18.3.1.4-8 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, HD-FDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations. | |

Table 18.3.1.4.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 36.508 [25] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.16-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 18.3.1.4.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in clause C.2.2 |
| Connection Diagram | TE Part | A.3.1.8.2 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.2.3.4 |
| Exceptions to connection diagram | N/A | |  |

Table 18.3.1.4.4.1-3: General test parameters for NR inter-RAT event triggered reporting for FR1 with SSB time index detection

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | | Comment |
| Test 1 | Test 2 |
| E-UTRA RF Channel Numbers | |  | 1 | | One E-UTRA carrier frequency is used. |
| NR RF Channel Number | |  | 1 | | One FR1 NR carrier frequency is used. |
| Active cell | |  | E-UTRA Cell 1 | | E-UTRA cell 1 is on E-UTRA RF channel number 1. |
| Neighbour cell | |  | NR Cell 2 | | NR cell 2 is on NR RF channel number 1. |
| Gap Pattern Id | |  | 0 | | As specified in TS 36.133 [23] Table 8.1.2.1-1. |
| Measurement gap offset | |  | 39 | | As specified in TS 36.331 [29]. |
| Hysteresis | | dB | 0 | |  |
| CP length | |  | Normal | |  |
| TimeToTrigger | | s | 0 | |  |
| Filter coefficient | |  | 0 | | L3 filtering is not used |
| DRX | |  | DRX.9 | DRX.12 | As specified in clause A.5 |
| Time offset between serving and neighbour cells | Config 1,4,7,8 |  | 3ms | | Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| Config 2,3,5,6 |  | 3μs | | Synchronous cells. |
| T1 | | s | 5 | |  |
| T2 | | s | 2 | 13 |  |

18.3.1.4.4.2 Test procedure

Same as the test procedure given in clause 8.4.2.4.4.2.

18.3.1.4.4.3 Message contents

Same as the message contents given in clause 8.4.2.4.4.3 with following exceptions:

- The specific message contents exceptions for test configuration 8.4.2.4-1 and 8.4.2.4-4 also apply to test configuration 18.3.1.4-7 and 18.3.1.4-8.

- Condition SSB.2 FR1 is replaced by SSB.1 RedCap FR1

- Table 8.4.2.4.4.3-2 is replaced by Table 18.3.1.4.4.3-1.

Table 18.3.1.4.4.3-1: SchedulingRequest-Config-DEFAULT

|  |  |  |  |
| --- | --- | --- | --- |
| Derivation Path: TS 36.508 [25] Table 4.6.3-20 | | | |
| Information Element | Value/remark | Comment | Condition |
| SchedulingRequest-Config-DEFAULT ::= CHOICE { |  |  |  |
| setup SEQUENCE { |  |  |  |
| sr-ConfigIndex | 25 |  | Config 18.3.1.4-1/2/3/7 |
|  | 22 |  | Config 18.3.1.4-4/5/6/8 |
| } |  |  |  |
| } |  |  |  |

18.3.1.4.5 Test requirement

Same as the test requirements given in clause 8.4.2.4.5 with following exceptions:

- Table 8.4.2.4.5-1 is replaced by Table 18.3.1.4.5-1.

- Table 8.4.2.4.5-2 is replaced by Table 18.3.1.4.5-2.

Table 18.3.1.4.5-1: E-UTRAN PCell specific test parameters for NR inter-RAT event triggered reporting in DRX with NR neigbour cell in FR1 with SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 1 | |
| T1 | T2 |
| RF channel number | |  | 1 | |
| Duplex mode | Config 1,2,3,7 |  | FDD | |
| Config 4,5,6,8 |  | TDD | |
| TDD special subframe configurationNote1 | Config 4,5,6,8 |  | 6 | |
| TDD uplink-downlink configurationNote1 | Config 4,5,6,8 |  | 1 | |
| BWchannel | | MHz | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | |
| PDSCH parameters:  DL Reference Measurement ChannelNote2 | Config 1,2,3,7 |  | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | |
| Config 4,5,6,8 |  | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote2 | Config 1,2,3,7 |  | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | |
| Config 4,5,6,8 |  | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | |
| OCNG PatternsNote2 | Config 1,2,3,7 |  | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | |
| Config 4,5,6,8 |  | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | |
| b2-Threshold1 | | dBm | -77 | |
| PBCH\_RA | | dB | 0 | |
| PBCH\_RB | |
| PSS\_RA | |
| SSS\_RA | |
| PCFICH\_RB | |
| PHICH\_RA | |
| PHICH\_RB | |
| PDCCH\_RA | |
| PDCCH\_RB | |
| PDSCH\_RA | |
| PDSCH\_RB | |
| OCNG\_RANote3 | |
| OCNG\_RBNote3 | |
| NocNote4 | | dBm/15 kHz | -104 | |
| Ês/Noc | | dB | 17 | 17 |
| Ês/IotNote5 | | dB | 17 | 17 |
| RSRPNote5 | | dBm/15 kHz | -87 | -87 |
| SCH\_RPNote5 | | dBm/15 kHz | -87 | -87 |
| IoNote5 | | dBm/ 9 MHz | -56.12 | -56.12 |
| Propagation Condition Note6 | |  | AWGN | |
| Antenna Configuration and Correlation Matrix Note6 | |  | 1x2 | |
| Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [24].  Note 2: DL RMCs and OCNG patterns are specified in clauses A.3.1 and A.3.2 of TS 36.133 [23] respectively.  Note 3: 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: Interference from other cells and noise sources 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 5: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 6: Propagation condition and correlation matrix are defined in clause B.2 in TS 36.101 [27]. | | | | |

Table 18.3.1.4.5-2: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR1 with SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | |
| T1 | T2 |
| NR RF Channel Number | |  | 1 | |
| Duplex mode | Config 1,4 |  | FDD | |
| Config 2,3,5,6 | TDD | |
| Config 7,8 | HD-FDD | |
| TDD configuration | Config 2,5 |  | TDDConf.1.1 | |
| Config 3,6 | TDDConf.2.1 | |
| BWchannel | Config 1,2,4,5,7,8 | MHz | 10: NRB,c = 52 | |
| Config 3,6 | 20: NRB,c = 51 | |
| OCNG Patterns | |  | OP.1 | |
| SMTC configuration | Config 1,4,7,8 |  | SMTC.2 | |
| Config 2,3,5,6 | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | Config 1,2,4,5,7,8 | kHz | 15 | |
| Config 3,6 | 30 | |
| b2-Threshold2NR | Config 1,2,4,5,7,8 | dBm/SCS | -101 | |
| Config 3,6 | -98 | |
| EPRE ratio of PSS to SSS | | dB | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |
| EPRE ratio of PBCH to PBCH DMRS | |
| EPRE ratio of PDCCH DMRS to SSS | |
| EPRE ratio of PDCCH to PDCCH DMRS | |
| EPRE ratio of PDSCH DMRS to SSS | |
| EPRE ratio of PDSCH to PDSCH | |
| EPRE ratio of OCNG DMRS to SSS Note 1 | |
| EPRE ratio of OCNG to OCNG DMRS Note 1 | |
| Note2 | | dBm/15kHz | -98 | |
| Note2 | Config 1,2,4,5,7,8 | dBm/SCS | -98 | |
| Config 3,6 | -95 | |
| SS-RSRP Note 3 | Config 1,2,4,5,7,8 | dBm/SCS | -Infinity | -91 |
| Config 3,6 | -Infinity | -88 |
|  | | dB | -Infinity | 7 |
|  | | dB | -Infinity | 7 |
| IoNote3 | Config 1,2,4,5,7,8 | dBm/9.36MHz | -70.05 | -62.26 |
| Config 3,6 | dBm/18.36MHz | -67.12 | -59.33 |
| Propagation Condition | |  | AWGN | |
| Antenna Configuration and Correlation Matrix | |  | 1x2 | |
| NOTE 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  NOTE 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  NOTE 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | |

#### 18.3.1.5 E-UTRA - NR SA FR2 event triggered reporting without SSB time index detection in non-DRX

Editor’s Notes: This test case is incomplete:

- E-UTRA – NR FR2 testability issue is not cleared.

- The TT analysis is complete for test frequencies f ≤ 40.8 GHz

- The TT analysis is complete for UE PC3

- This test case is incomplete for UE power classes other than PC3

- This test case is incomplete for Test frequencies f > 40.8 GHz

18.3.1.5.1 Test purpose

To verify that the RedCap UE makes correct reporting of an event. This test will partly verify the NR inter-RAT cell search requirements in clause TS 36.133 [23] clause 8.20.2 for E-UTRAN FDD-NR measurements and TS 36.133 [23] clause 8.20.3 for E-UTRAN TDD-NR measurements.

18.3.1.5.2 Test applicability

This test applies to all E-UTRA UE from release 17 onwards and capable of NR RedCap with 2Rx. Test 1 applies to UEs not supporting per-FR gap and test 2 applies only to UEs supporting per-FR gap.

18.3.1.5.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 18.3.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.18.3.1.5.

18.3.1.5.4 Test description

18.3.1.5.4.1 Initial conditions

Same as the initial conditions given in clause 8.4.2.5.4.1 with following exceptions:

- Table 8.4.2.5.4.1-1 is replaced by Table 18.3.1.5.4.1-1.

- Table 8.4.2.5.4.1-2 is replaced by Table 18.3.1.5.4.1-2.

- Table 8.4.2.5.4.1-3 is replaced by Table 18.3.1.5.4.1-3.

Table 18.3.1.5.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.3.1.5-1 | LTE FDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 18.3.1.5-2 | LTE TDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations. | |

Table 18.3.1.5.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 36.508 [25] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.16-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 18.3.1.5.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in clause C.2.2 |
| Connection Diagram | TE Part | A.3.3.3.1 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.4.1.1 |
| Exceptions to connection diagram | N/A | |  |

Table 18.3.1.5.4.1-3: General test parameters for NR inter-RAT event triggered reporting for FR2 without SSB time index detection in non-DRX

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | | Comment |
| Test 1 | Test 2 |
| E-UTRA RF Channel Numbers | |  | 1 | | One E-UTRA carrier frequency is used. |
| NR RF Chanel Number | |  | 1 | | One FR1 NR carrier frequency is used. |
| Active cell | |  | E-UTRA Cell 1 | | E-UTRA cell 1 is on E-UTRA RF channel number 1. |
| Neighbour cell | |  | NR Cell 2 | | NR cell 2 is on NR RF channel number 1. |
| Gap Pattern Id | |  | 0 | N/A | As specified in Table 8.1.2.1-1 of TS 36.133 [23]. |
| Measurement gap offset | |  | 39 | N/A | As specified in TS 36.331 [29]. |
| Hysteresis | | dB | 0 | |  |
| CP length | |  | Normal | |  |
| TimeToTrigger | | s | 0 | |  |
| Filter coefficient | |  | 0 | | L3 filtering is not used |
| DRX | |  | OFF | | DRX is not used |
| Time offset between serving and neighbour cells | Config 1 |  | 3ms | | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| Config 2 |  | 3μs | | Synchronous cells. |
| T1 | | s | 10 | |  |
| T2 | | s | 6 | 3 |  |

18.3.1.5.4.2 Test procedure

Same as the test procedure given in clause 8.4.2.5.4.2.

18.3.1.5.4.3 Message contents

Same as the message contents given in clause 8.4.2.5.4.3.

18.3.1.5.5 Test requirement

Same as the test requirements given in clause 8.4.2.5.5 with following exceptions:

- Table 8.4.2.5.5-1 is replaced by Table 18.3.1.5.5-1.

Table 18.3.1.5.5-1: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR2 without SSB time index detection in non-DRX

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | |
| T1 | T2 |
| AoA setup | |  | Setup 2a | |
| Assumption for UE beamsNote 3 | |  | Rough | |
| NR RF Channel Number | |  | 1 | |
| Duplex mode | |  | TDD | |
| TDD configuration | |  | TDDConf.3.1 | |
| BWchannel | | MHz | 100: NRB,c = 24 | |
| OCNG patterns | |  | OP.3 | |
| SMTC configuration | Config 1 |  | SMTC.2 | |
| Config 2 | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 120 | |
| b1-ThresholdNR | UE power class 3 | dBm/SCS | -118 | |
| EPRE ratio of PSS to SSS | | dB | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |
| EPRE ratio of PBCH to PBCH DMRS | |
| EPRE ratio of PDCCH DMRS to SSS | |
| EPRE ratio of PDCCH to PDCCH DMRS | |
| EPRE ratio of PDSCH DMRS to SSS | |
| EPRE ratio of PDSCH to PDSCH | |
| EPRE ratio of OCNG DMRS to SSS Note 1 | |
| EPRE ratio of OCNG to OCNG DMRS Note 1 | |
| Ês | | dBm/SCS | -Infinity | -80.6 |
| SSB\_RP Note 2 | | dBm/SCS | -Infinity | -80.6 |
| Ês/IotBB Note 4 | | dB | -Infinity | 8.3 |
| IoNote3 | | dBm/95.04MHz | -Infinity | -56.0 |
| Propagation Condition | |  | No external noise (Note 5) | |
| Note 1: OCNG shall be used such that a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: Information about types of UE beam is given in clause B.2.1.3, and does not limit UE implementation or test system implementation  Note 4: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 38.101-2 [19], and an allowance of 1dB for UE multi-band relaxation factor ΔMBP from TS 38.101-2 [19] Table 6.2.1.3-4.  Note 5: The downlink connection between the System Simulator and the UE is without Additive White Gaussian Noise, and has no fading or multipath effects as specified in TS 38.521-2 B.0 [18]. | | | | |

#### 18.3.1.6 E-UTRA - NR SA FR2 event triggered reporting without SSB time index detection in DRX

Editor’s Notes: This test case is incomplete:

- E-UTRA – NR FR2 testability issue is not cleared.

- The TT analysis is complete for test frequencies f ≤ 40.8 GHz

- The TT analysis is complete for UE PC3

- This test case is incomplete for UE power classes other than PC3

- This test case is incomplete for Test frequencies f > 40.8 GHz

18.3.1.6.1 Test purpose

To verify that the RedCap UE makes correct reporting of an event. This test will partly verify the NR inter-RAT cell search requirements in clause TS 36.133 [23] clause 8.20.2 for E-UTRAN FDD-NR measurements and TS 36.133 [23] clause 8.20.3 for E-UTRAN TDD-NR measurements.

18.3.1.6.2 Test applicability

This test applies to all E-UTRA UE from release 17 onwards and capable of NR RedCap with 2Rx. Test 1 and test 2 apply to UEs not supporting per-FR gap. Test 3 and test 4 apply only to UEs supporting per-FR gap.

18.3.1.6.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 18.3.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.18.3.1.6.

18.3.1.6.4 Test description

18.3.1.6.4.1 Initial conditions

Same as the initial conditions given in clause 8.4.2.6.4.1 with following exceptions:

- Table 8.4.2.6.4.1-1 is replaced by Table 18.3.1.6.4.1-1.

- Table 8.4.2.6.4.1-2 is replaced by Table 18.3.1.6.4.1-2.

- Table 8.4.2.6.4.1-3 is replaced by Table 18.3.1.6.4.1-3.

Table 18.3.1.6.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.3.1.6-1 | LTE FDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 18.3.1.6-2 | LTE TDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations. | |

Table 18.3.1.6.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 36.508 [25] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.16-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 18.3.1.6.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in clause C.2.2 |
| Connection Diagram | TE Part | A.3.3.3.1 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.4.1.1 |
| Exceptions to connection diagram | N/A | |  |

Table 18.3.1.6.4.1-3: General test parameters for NR inter-RAT event triggered reporting for FR2 without SSB time index detection in DRX

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | | | | Comment |
| Test 1 | Test 2 | Test 3 | Test 4 |
| E-UTRA RF Channel Numbers | |  | 1 | | | | One E-UTRA carrier frequency is used. |
| NR RF Chanel Number | |  | 1 | | | | One FR1 NR carrier frequency is used. |
| Active cell | |  | E-UTRA Cell 1 | | | | E-UTRA cell 1 is on E-UTRA RF channel number 1. |
| Neighbour cell | |  | NR Cell 2 | | | | NR cell 2 is on NR RF channel number 1. |
| Gap Pattern Id | |  | 0 | | N/A | | As specified in Table 8.1.2.1-1 of TS 36.133 [23]. |
| Measurement gap offset | |  | 39 | | N/A | | As specified in TS 36.331 [29]. |
| Hysteresis | | dB | 0 | | | |  |
| CP length | |  | Normal | | | |  |
| TimeToTrigger | | s | 0 | | | |  |
| Filter coefficient | |  | 0 | | | | L3 filtering is not used |
| DRX | |  | DRX.9 | DRX.12 | DRX.9 | DRX.12 |  |
| Time offset between serving and neighbour cells | Config 1 |  | 3ms | | | | Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| Config 2 |  | 3μs | | | | Synchronous cells. |
| T1 | | s | 10 | | | |  |
| T2 | | s | 6 | 83 | 6 | 83 |  |

18.3.1.6.4.2 Test procedure

Same as the test procedure given in clause 8.4.2.6.4.2.

18.3.1.6.4.3 Message contents

Same as the message contents given in clause 8.4.2.6.4.3.

18.3.1.6.5 Test requirement

Same as the test requirements given in clause 8.4.2.6.5 with following exceptions:

- Table 8.4.2.6.5-1 is replaced by Table 18.3.1.6.5-1.

Table 18.3.1.6.5-1: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR2 without SSB time index detection in DRX

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | |
| T1 | T2 |
| AoA setup | |  | Setup 1 | |
| Assumption for UE beamsNote 3 | |  | Rough | |
| NR RF Channel Number | |  | 1 | |
| Duplex mode | |  | TDD | |
| TDD configuration | |  | TDDConf.3.1 | |
| BWchannel | | MHz | 100: NRB,c = 66 | |
| OCNG patterns | |  | OP.1 | |
| SMTC configuration | Config 1 |  | SMTC.2 | |
| Config 2 | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 120 | |
| b1-ThresholdNR | UE power class 3 | dBm/SCS | -106 | |
| EPRE ratio of PSS to SSS | | dB | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |
| EPRE ratio of PBCH to PBCH DMRS | |
| EPRE ratio of PDCCH DMRS to SSS | |
| EPRE ratio of PDCCH to PDCCH DMRS | |
| EPRE ratio of PDSCH DMRS to SSS | |
| EPRE ratio of PDSCH to PDSCH | |
| EPRE ratio of OCNG DMRS to SSS Note 1 | |
| EPRE ratio of OCNG to OCNG DMRS Note 1 | |
| Note2 | | dBm/15kHz | -104.7 | |
| Note2 | | dBm/SCS | -95.7 | |
| SS-RSRP Note 3 | | dBm/SCS | -Infinity | -87.7 |
| Note 4 | | dB | -Infinity | 8 |
|  | | dB | -Infinity | 8 |
| IoNote3 | | dBm/95.04MHz | -66.7 | -58.0 |
| 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 to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 5: Information about types of UE beam is given in clause B.2.1.3, and does not limit UE implementation or test system implementation | | | | |

#### 18.3.1.7 E-UTRA - NR SA FR2 event triggered reporting with SSB time index detection in non-DRX

Editor’s Notes: This test case is incomplete:

- E-UTRA – NR FR2 testability issue is not cleared.

- The TT analysis is complete for test frequencies f ≤ 40.8 GHz

- The TT analysis is complete for UE PC3

- This test case is incomplete for UE power classes other than PC3

- This test case is incomplete for Test frequencies f > 40.8 GHz

18.3.1.7.1 Test purpose

To verify that the RedCap UE makes correct reporting of an event. This test will partly verify the NR inter-RAT cell search requirements in clause TS 36.133 [23] clause 8.20.2 for E-UTRAN FDD-NR measurements and TS 36.133 [23] clause 8.20.3 for E-UTRAN TDD-NR measurements.

18.3.1.7.2 Test applicability

This test applies to all E-UTRA UE from release 17 onwards and capable of NR RedCap with 2Rx. Test 1 applies to UEs not supporting per-FR gap and test 2 applies only to UEs supporting per-FR gap.

18.3.1.7.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 18.3.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.18.3.1.7.

18.3.1.7.4 Test description

18.3.1.7.4.1 Initial conditions

Same as the initial conditions given in clause 8.4.2.7.4.1 with following exceptions:

- Table 8.4.2.7.4.1-1 is replaced by Table 18.3.1.7.4.1-1.

- Table 8.4.2.7.4.1-2 is replaced by Table 18.3.1.7.4.1-2.

- Table 8.4.2.7.4.1-3 is replaced by Table 18.3.1.7.4.1-3.

Table 18.3.1.7.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.3.1.7-1 | LTE FDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 18.3.1.7-2 | LTE TDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations. | |

Table 18.3.1.7.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 36.508 [25] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.16-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 18.3.1.7.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in clause C.2.2 |
| Connection Diagram | TE Part | A.3.3.3.1 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.4.1.1 |
| Exceptions to connection diagram | N/A | |  |

Table 18.3.1.7.4.1-3: General test parameters for NR inter-RAT event triggered reporting for FR2 with SSB time index detection in non-DRX

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | | Comment |
| Test 1 | Test 2 |
| E-UTRA RF Channel Numbers | |  | 1 | | One E-UTRA carrier frequency is used. |
| NR RF Chanel Number | |  | 1 | | One FR1 NR carrier frequency is used. |
| Active cell | |  | E-UTRA Cell 1 | | E-UTRA cell 1 is on E-UTRA RF channel number 1. |
| Neighbour cell | |  | NR Cell 2 | | NR cell 2 is on NR RF channel number 1. |
| Gap Pattern Id | |  | 0 | N/A | As specified in Table 8.1.2.1-1 of TS 36.133 [23]. |
| Measurement gap offset | |  | 39 | N/A | As specified in TS 36.331 [29]. |
| Hysteresis | | dB | 0 | |  |
| CP length | |  | Normal | |  |
| TimeToTrigger | | s | 0 | |  |
| Filter coefficient | |  | 0 | | L3 filtering is not used |
| DRX | |  | OFF | | DRX is not used |
| Time offset between serving and neighbour cells | Config 1 |  | 3ms | | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| Config 2 |  | 3μs | | Synchronous cells. |
| T1 | | s | 5 | |  |
| T2 | | s | 5 | 3 |  |

18.3.1.7.4.2 Test procedure

Same as the test procedure given in clause 8.4.2.7.4.2.

18.3.1.7.4.3 Message contents

Same as the message contents given in clause 8.4.2.7.4.3.

18.3.1.7.5 Test requirement

Same as the test requirements given in clause 8.4.2.7.5 with following exceptions:

- Table 8.4.2.7.5-1 is replaced by Table 18.3.1.7.5-1.

Table 18.3.1.7.5-1: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR2 with SSB time index detection in non-DRX

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | |
| T1 | T2 |
| AoA setup | |  | Setup 1 | |
| Assumption for UE beamsNote 3 | |  | Rough | |
| NR RF Channel Number | |  | 1 | |
| Duplex mode | |  | TDD | |
| TDD configuration | |  | TDDConf.3.1 | |
| BWchannel | | MHz | 100: NRB,c = 66 | |
| OCNG patterns | |  | OP.1 | |
| SMTC configuration | Config 1 |  | SMTC.2 | |
| Config 2 | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 120 | |
| b1-ThresholdNR | UE power class 3 | dBm/SCS | -106 | |
| EPRE ratio of PSS to SSS | | dB | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |
| EPRE ratio of PBCH to PBCH DMRS | |
| EPRE ratio of PDCCH DMRS to SSS | |
| EPRE ratio of PDCCH to PDCCH DMRS | |
| EPRE ratio of PDSCH DMRS to SSS | |
| EPRE ratio of PDSCH to PDSCH | |
| EPRE ratio of OCNG DMRS to SSS Note 1 | |
| EPRE ratio of OCNG to OCNG DMRS Note 1 | |
| Note2 | |  | -104.7 | |
| Note2 | |  | -95.7 | |
| SS-RSRP Note 3 | | dBm/SCS | -Infinity | -87.7 |
|  | |  | -Infinity | 8 |
|  | | dB | -Infinity | 8 |
| IoNote3 | | dBm/95.04MHz | -66.7 | -58.0 |
| 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 to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 5: Information about types of UE beam is given in clause B.2.1.3, and does not limit UE implementation or test system implementation | | | | |

#### 18.3.1.8 E-UTRA - NR SA FR2 event triggered reporting with SSB time index detection in DRX

Editor’s Notes: This test case is incomplete:

- E-UTRA – NR FR2 testability issue is not cleared.

- The TT analysis is complete for test frequencies f ≤ 40.8 GHz

- The TT analysis is complete for UE PC3

- This test case is incomplete for UE power classes other than PC3

- This test case is incomplete for Test frequencies f > 40.8 GHz

18.3.1.8.1 Test purpose

To verify that the RedCap UE makes correct reporting of an event. This test will partly verify the NR inter-RAT cell search requirements in clause TS 36.133 [23] clause 8.20.2 for E-UTRAN FDD-NR measurements and TS 36.133 [23] clause 8.20.3 for E-UTRAN TDD-NR measurements.

18.3.1.8.2 Test applicability

This test applies to all E-UTRA UE from release 17 onwards and capable of NR RedCap with 2Rx. Test 1 and test 2 apply to UEs not supporting per-FR gap. Test 3 and test 4 apply only to UEs supporting per-FR gap.

18.3.1.8.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 18.3.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.18.3.1.8.

18.3.1.8.4 Test description

18.3.1.8.4.1 Initial conditions

Same as the initial conditions given in clause 8.4.2.8.4.1 with following exceptions:

- Table 8.4.2.8.4.1-1 is replaced by Table 18.3.1.8.4.1-1.

- Table 8.4.2.8.4.1-2 is replaced by Table 18.3.1.8.4.1-2.

- Table 8.4.2.8.4.1-3 is replaced by Table 18.3.1.8.4.1-3.

Table 18.3.1.8.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 18.3.1.8-1 | LTE FDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 18.3.1.8-2 | LTE TDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations. | |

Table 18.3.1.8.4.1-2: Initial conditions

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Value | | Comment |
| Test environment | NC | | As specified in TS 36.508 [25] clause 4.1. |
| Test frequencies | As specified in Annex E, Table E.16-1 and TS 38.508-1 [14] clause 4.3.1. | | |
| Channel bandwidth | As specified by the test configuration selected from Table 18.3.1.8.4.1-1. | | |
| Propagation conditions | AWGN | | As specified in clause C.2.2 |
| Connection Diagram | TE Part | A.3.3.3.1 | As specified in TS 38.508-1 [14] Annex A. |
| DUT Part | A.3.4.1.1 |
| Exceptions to connection diagram | N/A | |  |

Table 18.3.1.8.4.1-3: General test parameters for NR inter-RAT event triggered reporting for FR2 with SSB time index detection in DRX

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | | | | Comment |
| Test 1 | Test 2 | Test 3 | Test 4 |
| E-UTRA RF Channel Numbers | |  | 1 | | | | One E-UTRA carrier frequency is used. |
| NR RF Chanel Number | |  | 1 | | | | One FR1 NR carrier frequency is used. |
| Active cell | |  | E-UTRA Cell 1 | | | | E-UTRA cell 1 is on E-UTRA RF channel number 1. |
| Neighbour cell | |  | NR Cell 2 | | | | NR cell 2 is on NR RF channel number 1. |
| Gap Pattern Id | |  | 0 | | N/A | | As specified in Table 8.1.2.1-1 of TS 36.133 [23]. |
| Measurement gap offset | |  | 39 | | N/A | | As specified in TS 36.331 [29]. |
| Hysteresis | | dB | 0 | | | |  |
| CP length | |  | Normal | | | |  |
| TimeToTrigger | | s | 0 | | | |  |
| Filter coefficient | |  | 0 | | | | L3 filtering is not used |
| DRX | |  | DRX.9 | DRX.12 | DRX.9 | DRX.12 |  |
| Time offset between serving and neighbour cells | Config 1 |  | 3ms | | | | Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| Config 2 |  | 3μs | | | | Synchronous cells. |
| T1 | | s | 5 | | | |  |
| T2 | | s | 7 | 70 | 7 | 70 |  |

18.3.1.8.4.2 Test procedure

Same as the test procedure given in clause 8.4.2.8.4.2.

18.3.1.8.4.3 Message contents

Same as the message contents given in clause 8.4.2.8.4.3.

18.3.1.8.5 Test requirement

Same as the test requirements given in clause 8.4.2.8.5 with following exceptions:

- Table 8.4.2.8.5-1 is replaced by Table 18.3.1.8.5-1.

Table 18.3.1.8.5-1: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR2 with SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | |
| T1 | T2 |
| AoA setup | |  | Setup 1 | |
| Assumption for UE beamsNote 3 | |  | Rough | |
| NR RF Channel Number | |  | 1 | |
| Duplex mode | |  | TDD | |
| TDD configuration | |  | TDDConf.3.1 | |
| BWchannel | | MHz | 100: NRB,c = 66 | |
| OCNG patterns | |  | OP.1 | |
| SMTC configuration | Config 1 |  | SMTC.2 | |
| Config 2 | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 120 | |
| b1-ThresholdNR | UE power class 3 | dBm/SCS | -106 | |
| EPRE ratio of PSS to SSS | | dB | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |
| EPRE ratio of PBCH to PBCH DMRS | |
| EPRE ratio of PDCCH DMRS to SSS | |
| EPRE ratio of PDCCH to PDCCH DMRS | |
| EPRE ratio of PDSCH DMRS to SSS | |
| EPRE ratio of PDSCH to PDSCH | |
| EPRE ratio of OCNG DMRS to SSS Note 1 | |
| EPRE ratio of OCNG to OCNG DMRS Note 1 | |
| Note2 | | dBm/15kHz | -104.7 | |
| Note2 | | dBm/SCS | -95.7 | |
| SS-RSRP Note 3 | | dBm/SCS | -Infinity | -87.7 |
| Note 4 | | dB | -Infinity | 8 |
|  | | dB | -Infinity | 8 |
| IoNote3 | | dBm/95.04MHz | -66.7 | -58.0 |
| 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 to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 5: Information about types of UE beam is given in clause B.2.1.3, and does not limit UE implementation or test system implementation | | | | |

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