3GPP TSG-RAN WG4 Meeting # 111 R4-2410268

Fukuoka , JP, 20 May – 24 May 2024

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | 36.133 | **CR** | 7318 | **rev** | 1 | **Current version:** | 18.5.0 |  |
|  | | | | | | | | |
| *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 | **X** | Core Network |  |

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| ***Title:*** | Big CR to TS 36.133 on performance requirements for IoT NTN enhancements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | MediaTek inc. | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | IoT\_NTN\_enh-Perf | | | | |  | ***Date:*** | | | 20 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | |  |
|  | *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:*** | | * Formal CR for the draft big CRs R4-2406522 endorsed at RAN4 #110bis * Capture the following CRs endorsed at RAN4 #111  |  |  |  | | --- | --- | --- | | **T-doc number** | **Title** |  | | [R4-2407201](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407201.zip) | Correction on unit of k-Offset/k-Mac for SIB31/SIB33 | A.3.28.5 | | [R4-2407203](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407203.zip) | CR on updating annex B for NTN bands | B.1.11 - B.1.12, B.2.28 - B.2.30 | | [R4-2407202](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407202.zip) | Add NGSO test configuration for NB-IoT/eMTC | A.13.1.1, A.13.3.1, A.14.1.1, A.14.2.1, A.14.3.1 | | [R4-2407937](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407937.zip) | (IoT\_NTN\_enh-Perf) draftCR to TS 36.133 Introduction of the NGSO test configuration for measurmenet procedure and performance TC for Cat-M1 UE | A.14.5.1, A.14.6.1 | | [R4-2407938](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407938.zip) | (IoT\_NTN\_enh-Perf) draftCR to TS 36.133 Introduce of cell re-selection test cases for Cat-M1 UE | new  A.14.1.1.5 - A.14.1.1.10 | | R4-2410264 | DraftCR on 36.133 Test Cases for location-based triggering of intra-frequency measurements for Cat-M1 devices | new  A.14.5.1.5, A.14.5.1.6 | | R4-2410265 | DraftCR on 36.133 Test Cases for time-based triggering of interfrequency measurements for Cat-M1 devices | new  A.14.5.2.1, A.14.5.2.2, A.14.5.2.3 | | R4-2410266 | DraftCR to TS 36.133 on test cases for intra-frequency measurements with time-based triggering  for Cat-M1 devices | new  A.14.5.1.7 | | R4-2410267 | Draft CR on TC for eMTC for R18 IoT NTN enh | new  A.14.2.1.13-14  A.14.5.2.X1 - A.14.5.2.X6 | | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Changes on A.3.28.5 (existing)   * R4-2406315   + Introduce Neighbor Satellite Configuration   + Fix formatting on the title of subclause A.3.28.5.1 * R4-2407201   + Fix formatting on the title of subclause A.3.28.5.1   + Correct unit of k-Offset / k-Mac   Changes on A.13.1 (existing A.13.1.1.1- A.13.1.1.3)   * R4-2407202: Add NGSO test configuration   Changes on A.13.1 (new A.13.1.1.4 - A.13.1.1.6)   * R4-2405432: Introduce RRM Test cases of cell re-selection enhancement and inter-frequency RRC re-establishement for NB-IoT over NTN.   Changes on A.13.3 (existing A.13.3.1.1- A.13.3.1.2)   * R4-2407202: Add NGSO test configuration   Changes on A.13.3 (new A.13.3.1.3)   * R4-2405432: Introduce RRM Test cases of cell re-selection enhancement and inter-frequency RRC re-establishement for NB-IoT over NTN.   Changes on A.13.5 (new A.13.5):   * R4-2404995: Introduce following TC for R18 IoT NTN enh for NB-IoT:   + HD-FDD Intra-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage   + HD-FDD Inter-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage   + HD-FDD Intra-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage, location-based triggering   Changes on A.14.1.1 (existing A.14.1.1.1- A.14.1.1.4)   * R4-2407202: Add NGSO test configuration   Changes on A.14.1.1 (new A.14.1.1.5 - A.14.1.1.10):   * R4-2406316: Introduce following cell re-selection test cases for eMTC over NTN    + EUTRAN FDD – FDD Inter frequency case for Cat-M1 UE in normal coverage   + E-UTRAN HD – FDD Inter frequency case for Cat-M1 UE in normal coverage   + E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage, time-based triggering   + E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in [enhanced] coverage, time-based triggering   + E-UTRAN FDD – FDD Inter frequency case for Cat-M1 UE in enhanced coverage, location-based triggering * R4-2407939: Further supplement the applicability rule of test configuration based on the endorsed draftCR R4-2406316.   Changes on A.14.2.1:   * R4-2407202 (existing A.14.2.1.1 – A.14.2.1.4)   + Add NGSO test configuration * R4-2406319 (new A.14.2.1.5-6):   + Introduce test cases for Intra-frequency HO for Cat-M1 UEs in NTN * R4-2406318 (new A.14.2.1.7-10):   + Introduce test cases for Inter-frequency HO for Cat-M1 UEs in NTN * R4-2406320 (new A.14.2.1.11-12):   + Introduce test cases for Inter-frequency Conditional HO for Cat-M1 UEs in NTN * R4-2410267 (new A.14.2.1.13-16):   + Introduce test cases for Time/location based conditional Handover   Changes on A.14.3.1:   * R4-2407202 (existing A.14.3.1.1-2)   + Add NGSO test configuration * R4-2406317 (new A.14.3.1.3-4):   + Test case for “E-UTRAN FD-FDD Inter-frequency RRC Re-establishment for Cat-M1 UE in CEModeA” is introduced.   + Test case for “E-UTRAN HD-FDD Inter-frequency RRC Re-establishment for Cat-M1 UE in CEModeA” is introduced.   Changes on A.14.5.1:   * R4-2407937 (existing A.14.5.1.1-4)   + Add NGSO test configuration * R4-2410264 (new A.14.5.1.5-6)   + Introduce new test cases for intra-frequency measurement reports with distance based triggers * R4-2410266 (new A.14.5.1.7)   + Introduce new test cases for intra-frequency measurement reports with time based triggers   Changes on A.14.5.2 (new)   * R4-2410265 (new A.14.5.2.1 - A.14.5.2.3)   + Introduce new test cases for inter-frequency measurement reports with time based triggers * R4-2410267 (new A.14.5.2.X1 - A.14.5.2.X6)   + UE measurement procedure in RRC-CONNECTED   Changes on A.14.6.1:   * R4-2407937 (existing A.14.6.1.1-2)   + Add NGSO test configuration * R4-2406321 (new A.14.6.1.3-6):   + Introduce RRM Test cases of RSRP inter frequency measurement accuracy for Cat-M1 over NTN.   Changes on B (new):   * R4-2407203   + Intoduce conditions for measurements of inter-frequency cell re-selection for NB-IoT and eMTC for satellite access.   + Intoduce conditions for inter-frequency measurements for M1 for satellite access   + Intoduce conditions for neighbour cell measurements for NB-IoT for satellite access | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incomplete test cases for IoT NTN enhancements | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | Existing   * A.3.28.5 * A.13.1.1.1- A.13.1.1.3 * A.13.3.1.1- A.13.3.1.2 * A.14.1.1.1- A.14.1.1.4 * A.14.2.1.1- A.14.2.1.4 * A.14.3.1.1-2 * A.14.5.1.1-4 * A.14.6.1.1-2   New   * A.13.1.1.4 - A.13.1.1.6 * A.13.3.1.3 * A.13.5 * A.14.1.1.5 - A.14.1.1.10 * A.14.2.1.5 - A.14.2.1.12 * A.14.3.1.3 - A.14.3.1.4 * A.14.5.1.5 - A.14.5.1.7 * A.14.5.2 * A.14.6.1.3-6 * B.1.11 - B.1.12, B.2.28 - B.2.30 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 36.521-3 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## <<< START OF CHANGES >>>

#### A.3.28.5.1 Satellite specific configuration for serving cell

The general parameters for SIB31 setup for serving satellite are specified in Table A.3.28.5.1-1. Table A.3.28.5.1-1: SIB31/SIB31-NB parameters setup for Serving satellite

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | |
| Reference configuration for serving satellite |  | SSC.1 | SSC.2 |
| Scenario |  | GSO or GEO (as per test definition) | NGSO |
| Interval between adjacent epoch time | s | 10.24 | 2.56 |
| ul-SyncValidityDuration-r17 | s | 900 | 5 |
| k-Offset-r17 | ms | 258 | 14 |
| k-Mac-r17 | ms | Not configured | Not configured |
| nta-Common-r17 |  | 0 | 0 |
| nta-CommonDrift-r17 |  | 0 | 0 |
| nta-CommonDriftVariation-r17 |  | 0 | 0 |
| ephemerisInfo |  | According to Annex B.8 | |

#### A.3.28.5.2 Satellite specific configuration for neighbour cell



The general parameters for SIB33 setup for neighbor cells in both serving and neighbour satellites are specified in Table A.3.28.5.2-1.

Table A.3.28.5.2-1: SIB33/SIB33-NB parameters setup for neighbour cell

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Value | | | |
| Reference configuration for satellite assistance information for neighbor cell |  | NSC.1 | NSC.2 | NSC.3 | NSC.4 |
| Scenario |  | GSO or GEO (as per test definition) | NGSO | GSO or GEO (as per test definition) | NGSO |
| Interval between adjacent epoch time | s | 10.24 | 2.56 | 10.24 | 2.56 |
| *neighValidityDuration-r18* | s | 900 | 5 | 900 | 5 |
| k-Mac-r18 | ms | Not configured | Not configured | Not configured | Not configured |
| nta-Common-r18 |  | 0 | 0 | 0 | 0 |
| nta-CommonDrift-r18 |  | 0 | 0 | 0 | 0 |
| nta-CommonDriftVariation-r18 |  | 0 | 0 | 0 | 0 |
| ephemerisInfo |  | Same as used for serving satellite | | According to Annex B.8 NOTE1 | |
| t-ServiceStartNeigh-r18 |  | NOTE 2 | | | |
| Note 1: The ephemeris information for those neighbor cells shall be different than that used for the serving cell, i.e., these cells are associated to a different satellite.  Note 2: Unless otherwise stated in the test case, *t-serviceStartNeigh-r18* is not configured for the neighbor satellite. | | | | | |

## <<< NEXT CHANGE >>>

# A.13 E-UTRAN Standalone Tests for UE Category NB for Satellite Access

## A.13.1 RRC\_IDLE state for satellite access

### A.13.1.1 Cell re-selection for satellite access

#### A.13.1.1.1 HD – FDD Intra frequency case for UE Category NB1 Standalone mode in normal coverage

##### A.13.1.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency cell reselection requirements for Cat-NB1 UE specified in clause 4.6A.2.2.

The test scenario comprises of one NB-IoT carrier with 2 nCells of different physical cell ID, as given in tables A.13.1.1.1.1-1, A.13.1.1.1.1-2 and A.13.1.1.1.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only nCell1 is already identified by the UE prior to the start of the test, i.e. nCell 2 is not identified. nCell 1 and nCell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing nCell 2.

The UE shall be provided with the valid information about the SAN serving cells before the test.

Table A.13.1.1.1.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

Table A.13.1.1.1.1-2: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| NB-IOT operational mode | |  | Standalone |  |
| Satellite information | Config 1 |  | SSC.1 for nCell1  NSC.1 for nCell2 | GSO |
| Config 2 |  | SSC.2 for nCell1  NSC.2 for nCell2 | NGSO |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| T2 end condition | Active cell |  | nCell2 |  |
| Neighbour cells |  | nCell1 |  |
| Final condition | Visited cell |  | nCell1 |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| *s-IntraSearchP-v1360s* | |  | 63 (126 dB) | to trigger intra-frequency measurement in this test |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | During T1, nCell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that nCell2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 60 | T2 is defined so that cell re-selection time is taken into account. Once the UE has reselected to nCell2 (within T2) T3 starts |
| T3 | | s | 15 | T3 is defined so that cell re-selection time is taken into account. |

Table A.13.1.1.1.1-3: nCell 1, nCell 2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **nCell 1** | | | **nCell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| BWchannel | kHz | 200 | | | 200 | | |
| OCNG Pattern as defined in A.3 | **-** | NOP.3 FDD | | | NOP.3 FDD | | |
| NPBCH\_RA | dB | 0 | | | 0 | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -140 | -140 | -140 | -140 | -140 | -140 |
| Pcompensation | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qhysts | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qoffsets, n | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | NRSRP | | | NRSRP | | |
|  | dBm/15 kHz | -98 | | | | | |
|  | dB | 17 | 13 | 17 | -infinity | 17 | 13 |
| Note2 | dB | 17 | -4.09 | 3.79 | -infinity | 3.79 | -4.09 |
| NRSRP Note2 | dBm/15 kHz | -81 | -85 | -81 | -infinity | -81 | -85 |
| Treselection | s | 0 | 0 | 0 | 0 | 0 | 0 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to nCell 1 | ms | - | | | 3 | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.13.1.1.1.2 Test Requirements

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

The cell re-selection delay to a newly detectable cell shall be less than 59.32 s.

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

The cell re-selection delay to an already detected cell shall be less than 14.82 s.

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,NB\_Intra\_NB-IoT-NC + TSI, and to an already detected cell can be expressed as: Tevaluate, NB\_intra\_NB-IoT-NC + TSI,

Where:

Tdetect,NB\_Intra\_NB-IoT-NC See Table 4.6A.2.2-1 in clause 4.6A.2.2

Tevaluate, NB\_intra\_NB-IoT-NC See Table 4.6A.2.2-1 in clause 4.6A.2.2

TSI Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 59.32 s, allow 60 s for the cell re-selection delay to a newly detectable cell and 14.82 s, allow 15s for the cell re-selection delay to an already detected cell in the test case.

#### A.13.1.1.2 HD – FDD Intra frequency case for UE Category NB1 Standalone mode in normal coverage with serving cell RRM measurement relaxation

##### A.13.1.1.2.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency cell reselection requirements for Cat-NB1 UE specified in clause 4.6A.2.1A when UE is configured to monitor WUS according to Table A.13.1.1.2.1-2 and under the serving cell RRM measurement relaxation according to the subclause 4.6A.2.1A and under the intra-frequency neighbor cell measurement relaxation according to the subclause 4.6A.2.2.

The test scenario comprises of one NB-IoT carrier with 2 nCells of different physical cell ID, as given in tables A.13.1.1.2.1-1, A.13.1.1.2.1-2 and A.13.1.1.2.1-3. The test consists of two successive time periods, with time duration of T1 and T2, respectively. Only nCell1 is already identified by the UE prior to the start of the test, i.e. nCell 2 is not identified. nCell 1 and nCell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing nCell 2.

The UE shall be provided with the valid information about the SAN serving cells before the test.

Table A.13.1.1.2.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

Table A.13.1.1.2.1-2: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| NB-IOT operational mode | |  | Standalone |  |
| Satellite information | Config 1 |  | SSC.1 for nCell1  NSC.1 for nCell2 | GSO |
| Config 2 |  | SSC.2 for nCell1  NSC.2 for nCell2 | NGSO |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| T2 end condition | Active cell |  | nCell2 |  |
| Neighbour cells |  | nCell1 |  |
| Final condition | Visited cell |  | nCell1 |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| *s-IntraSearchP-v1360s* | |  | 63 (126 dB) | to trigger intra-frequency measurement in this test |
| SSearchDeltaP | | dB | 6 | Threshold for relaxed monitoring criterion as specified in 5.2.4.12.1 in [1] |
| Rmax | |  | 128 |  |
| maxDurationFactor | |  | one4th | WUS config. Wmax = 32 (=1/4\*Rmax) |
| numPOs | |  | n1 | WUS config. Single PO mapped to each WUS occasion |
| timeOffsetDRX | |  | ms40 | WUS config. Gap between the end of WUS duration to the associated PO |
| numDRX-CycleRelaxed | |  | 4 | Serving cell RRM measurement is relaxed by |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T1 | | s | >30 | During T1, nCell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that nCell2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 70 | T2 is defined so that cell re-selection time is taken into account. |

Table A.13.1.1.2.1-3: nCell 1, nCell 2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **nCell 1** | | **nCell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| BWchannel | kHz | 200 | | 200 | |
| OCNG Pattern as defined in A.3 | **-** | NOP.3 FDD | | NOP.3 FDD | |
| NPBCH\_RA | dB | 0 | | 0 | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -140 | -140 | -140 | -140 |
| Pcompensation | dB | 0 | 0 | 0 | 0 |
| Qhysts | dB | 0 | 0 | 0 | 0 |
| Qoffsets, n | dB | 0 | 0 | 0 | 0 |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | NRSRP | | NRSRP | |
|  | dBm/15 kHz | -98 | | | |
|  | dB | 17 | 7 | -infinity | 11 |
| Note2 | dB | 17 | -4.33 | -infinity | 3.21 |
| NRSRP Note2 | dBm/15 kHz | -81 | -91 | -infinity | -87 |
| Treselection | s | 0 | 0 | 0 | 0 |
| Propagation Condition |  | AWGN | | AWGN | |
| Antenna Configuration |  | 1x1 | | 1x1 | |
| Timing offset to nCell 1 | ms | - | | 3 | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | |

A.13.1.1.2.2 Test Requirements

Before the beginning of T2, UE is under relaxed monitoring where the serving cell measurement is performed every 5.12 s and the infra-frequency measurement for the neighbor cells is relaxed according to subclause 5.2.4.12.0 in TS 36.304 [1].

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

The cell re-selection delay to a newly detectable cell shall be less than 69.56 s.

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

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tevaluate, serv\_NB-NC + Tdetect,NB\_Intra\_NB-IoT-NC + TSI.

Where:

Tdetect,NB\_Intra\_NB-IoT-NC See Table 4.6A.2.2-1 in clause 4.6A.2.2, based on the configured DRX cycle

Tevaluate, serv\_NB-NC See Table 4.6A.2.2-1 in clause 4.6A.2.2, based on the effective DRX cycle after relaxation; 10.24 s is assumed in this test case.

TSI Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 69.56 s, allow 70 s for the cell re-selection delay to a newly detectable in the test case.

#### A.13.1.1.3 HD – FDD Intra frequency case for UE Category NB1 Standalone mode in normal coverage with UE specific DRX

##### A.13.1.1.3.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency cell reselection requirements for Cat-NB1 UE specified in clause 4.6A.2.2.

The test scenario comprises of one NB-IoT carrier with 2 nCells of different physical cell ID, as given in tables A.13.1.1.3.1-1, A.13.1.1.3.1-2 and A.13.1.1.3.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only nCell1 is already identified by the UE prior to the start of the test, i.e. nCell 2 is not identified. nCell 1 and nCell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing nCell 2. In Test 1, UE supports the UE specific DRX cycle of 0.32 s and the UE shall be configured with DRX cycle of 0.32 s prior to the start of the test. In Test 2, UE supports the UE specific DRX cycle of 0.64 s and the UE shall be configured with DRX cycle of 0.64 s prior to the start of the test.

The UE shall be provided with the valid information about the SAN serving cells before the test.

Table A.13.1.1.3.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

Table A.13.1.1.3.1-2: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | | **Comment** |
| **Test 1** | **Test 2** |
| NB-IOT operational mode | |  | Standalone | |  |
| Satellite information | Config 1 |  | SSC.1 for nCell1  NSC.1 for nCell2 | | GSO |
| Config 2 |  | SSC.2 for nCell1  NSC.2 for nCell2 | | NGSO |
| Initial condition | Active cell |  | nCell1 | |  |
| Neighbour cells |  | nCell2 | |  |
| T2 end condition | Active cell |  | nCell2 | |  |
| Neighbour cells |  | nCell1 | |  |
| Final condition | Visited cell |  | nCell1 | |  |
| Access Barring Information | | - | Not Sent | | No additional delays in random access procedure. |
| *s-IntraSearchP*Table A.13.1.1.3.1-2: G | |  | 63 (126 dB) | | to trigger intra-frequency measurement in this test |
| DRX cycle length | | s | 0.32 | 0.64 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | | During T1, nCell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that nCell2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 35 | | T2 is defined so that cell re-selection time is taken into account. Once the UE has reselected to nCell2 (within T2) T3 starts |
| T3 | | s | 14 | | T3 is defined so that cell re-selection time is taken into account. |

**Table A.13.1.1.3.1-3: nCell 1, nCell 2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **nCell 1** | | | **nCell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| BWchannel | kHz | 180 | | | 180 | | |
| OCNG Pattern as defined in A.3 | **-** | NOP.3 FDD | | | NOP.3 FDD | | |
| NPBCH\_RA | dB | 0 | | | 0 | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -140 | -140 | -140 | -140 | -140 | -140 |
| Pcompensation | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qhysts | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qoffsets, n | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | NRSRP | | | NRSRP | | |
|  | dBm/15 kHz | -98 | | | | | |
|  | dB | 17 | 13 | 17 | -infinity | 17 | 13 |
| Note2 | dB | 17 | -4.09 | 3.79 | -infinity | 3.79 | -4.09 |
| NRSRP Note2 | dBm/15 kHz | -81 | -85 | -81 | -infinity | -81 | -85 |
| Treselection | s | 0 | 0 | 0 | 0 | 0 | 0 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to nCell 1 | ms | - | | | 3 | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.13.1.1.3.2 Test Requirements

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

The cell re-selection delay to a newly detectable cell shall be less than 34.32 s in test 1 and test 2.

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

The cell re-selection delay to an already detected cell shall be less than 13.44 s in test 1 and test 2.

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,NB\_Intra\_NC + TSI, and to an already detected cell can be expressed as: Tevaluate, NB\_intra\_NC + TSI,

Where:

Tdetect,NB\_Intra\_NC See Table 4.6A.2.2-1 in clause 4.6A.2.2

Tevaluate, NB\_intra\_NC See Table 4.6A.2.2-1 in clause 4.6A.2.2

TSI Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 34.32 s, allow 35 s for the cell re-selection delay to a newly detectable cell and 13.44 s, allow 14s for the cell re-selection delay to an already detected cell in the test case.

## <<< NEXT CHANGE >>>

#### A.13.1.1.4 HD – FDD Inter frequency case for UE Category NB1 Standalone mode in normal coverage

##### A.13.1.1.4.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD inter frequency cell reselection requirements for Cat-NB1 UE specified in clause 4.6A.2.5.

The test scenario comprises of 2 cells as given in tables A.13.1.1.4.1-1, A.13.1.1.4.1-2 and A.13.1.1.4.1-3. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. Only nCell1 is already identified by the UE prior to the start of the test, i.e. nCell 2 is not identified. nCell 1 and nCell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing nCell 2.

Table A.13.1.1.4.1-1: Supported test configurations

|  |  |  |
| --- | --- | --- |
| **Configuration** | **Description** | |
| 1 | GSO, HD-FDD duplex mode | |
| 2 | NGSO, HD-FDD duplex mode | |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

Table A.13.1.1.4.1-2: General test parameters for HD-FDD inter frequency cell reselection test case for Cat-NB1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| NB-IOT operational mode | |  | Standalone |  |
| Satellite information | Config 1 |  | SSC.1 for nCell1  NSC.1 for nCell2 | GSO |
| Config 2 |  | SSC.2 for nCell1  NSC.2 for nCell2 | NGSO |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| T2 end condition | Active cell |  | nCell2 |  |
| Neighbour cells |  | nCell1 |  |
| Final condition | Visited cell |  | nCell1 |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T0 | | s | 5 | During T0, UE decodes SIB3-NB and SIB5-NB to acquire the inter-frequency carrier information. |
| T1 | | s | >7 | During T1, nCell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that nCell2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 60 | T2 is defined so that cell re-selection time is taken into account. |
| T3 | | s | 15 | T3 is defined so that cell re-selection time is taken into account. |

Table A.13.1.1.4.1-3: nCell 1, nCell 2 specific test parameters for HD-FDD inter frequency cell reselection test case for Cat-NB1 UE in normal coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | nCell 1 | | | nCell 2 | | |
|  |  | T1 | T2 | T3 | T1 | T2 | T3 |
| BWchannel | kHz | 180 | | | 180 | | |
| NPBCH\_RA | dB | 0 | | | 0 | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -140 | | | -140 | | |
| Pcompensation | dB | 0 | | | 0 | | |
| Qhysts | dB | 0 | | | 0 | | |
| Qoffsets, n | dB | 0 | | | 0 | | |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | NRSRP | | | NRSRP | | |
|  | dBm/15 kHz | -98 | | | | | |
|  | dB | 17 | 13 | 17 | -infinity | 17 | 13 |
| Note2 | dB | 17 | 13 | 17 | -infinity | 17 | 13 |
| NRSRP Note2 | dBm/15 kHz | -81 | -85 | -81 | -infinity | -81 | -85 |
| Treselection | s | 0 | | | 0 | | |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to nCell 1 | ms | 0 | | | | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.13.1.1.4.2 Test Requirements

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

The cell re-selection delay to a newly detectable cell shall be less than 59.32 s.

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

The cell re-selection delay to an already detected cell shall be less than 14.82 s.

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,NB\_Inter\_EC + TSI, and to an already detected cell can be expressed as: Tevaluate, NB\_Inter\_EC + TSI,

Where:

Tdetect,NB\_Inter\_EC See Table 4.6A.2.5-1 in clause 4.6A.2.5

Tevaluate, NB\_Inter\_EC See Table 4.6A.2.5-1 in clause 4.6A.2.5

TSI Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 59.32 s, allow 60 s for the cell re-selection delay to a newly detectable cell and 14.82 s, allow 15 s for the cell re-selection delay to an already detected cell in the test case.

#### A.13.1.1.5 HD – FDD Intra frequency case for UE Category NB1 Standalone mode in enhanced coverage, location-based cell reselection for NGSO

##### A.13.1.1.5.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency cell reselection requirements for Cat-NB1 UE specified in clause 4.6A.2.4.

The test scenario comprises of one NB-IoT carrier with 2 nCells of different physical cell ID, as given in tables A.13.1.1.5.1-1, A.13.1.1.5.1-2 and A.13.1.1.5.1-3. The test consists of 3 successive time periods, with time duration of T0, T1, and T2 respectively. Only nCell1 is already identified by the UE prior to the start of the test, i.e. nCell 2 is not identified. nCell 1 and nCell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing nCell 2.

The UE shall be provided with the valid information about the SAN serving cells before the test.

At 4s after the start of T2, the UE location is changed such that the distance to the reference location broadcasted in SIB31 of Cell 1 is exceeded by the configured value in *distanceThresh* plus 50m.

Table A.13.1.1.5.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | NGSO, HD-FDD duplex mode |

Table A.13.1.1.5.1-2: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| NB-IOT operational mode | |  | Standalone |  |
| Satellite information | Config 1 |  | SSC.2 for nCell1  NSC.2 for nCell2 | NGSO |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| T2 end condition | Active cell |  | nCell2 |  |
| Neighbour cells |  | nCell1 |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | During T1, nCell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that nCell2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 71 | T2 is defined so that cell re-selection time is taken into account. |

Table A.13.1.1.5.1-3: nCell 1, nCell 2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | nCell 1 | | | nCell 2 | | |
| T0 | T1 | T2 | T0 | T1 | T2 |
| BWchannel | kHz | 200 | | | 200 | | |
| OCNG Pattern as defined in A.3 | - | NOP.3 FDD | | | NOP.3 FDD | | |
| NPBCH\_RA | dB | 0 | | | 0 | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -156 | | | -156 | | |
| Pcompensation | dB | 0 | | | 0 | | |
| Qhysts | dB | 0 | | | 0 | | |
| Qoffsets, n | dB | 0 | | | 0 | | |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | NRSRP | | | NRSRP | | |
|  | dBm/15 kHz | -98 | | | | | |
|  | dB | 10 | -9 | -9 | -infinity | -infinity | -0.7 |
| Note2 | dB | 10 | -9 | -11.67 | -infinity | -infinity | -1.21 |
| NRSRP Note2 | dBm/15 kHz | -88 | -107 | -107 | -infinity | -infinity | -98.7 |
| Treselection | s | 0 | 0 | 0 | 0 | 0 | 0 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to nCell 1 | ms | - | | | 3 | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.13.1.1.5.2 Test Requirements

The cell reselection delay to a newly detectable cell is defined as the time from 4s after the beginning of time period T2, to the moment when the UE camps on nCell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on nCell 2.

The cell re-selection delay to a newly detectable cell shall be less than 66.32 s.

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,NB\_Intra\_NB-IoT-NC + TSI, and to an already detected cell can be expressed as: Tevaluate, NB\_intra\_NB-IoT-NC + TSI,

Where:

Tdetect,NB\_Intra\_NB-IoT-NC See Table 4.6A.2.4-1 in clause 4.6A.2.4

Tevaluate, NB\_intra\_NB-IoT-NC See Table 4.6A.2.4-1 in clause 4.6A.2.4

TSI Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of (66.32+4) s, allow 69 s after T2, for the cell re-selection delay to a newly detectable cell.

#### A.13.1.1.6 HD – FDD Inter frequency case for UE Category NB1 Standalone mode in enhanced coverage, time-based cell reselection for NGSO

##### A.13.1.1.6.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD inter frequency cell reselection requirements for Cat-NB1 UE specified in clause 4.6A.2.6.

The test scenario comprises of 2 cells as given in tables A.13.1.1.6.1-1, A.13.1.1.6.1-2 and A.13.1.1.6.1-3. The test consists of 3 successive time periods, with time duration of T0, T1, and T2 respectively. Only nCell1 is already identified by the UE prior to the start of the test, i.e. nCell 2 is not identified. nCell 1 and nCell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing nCell 2.

t-Service broadcasted in *SystemInformationBlockType3-NB* of Cell 1 is set to the time point that is 67s after start of T2.

Table A.13.1.1.6.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | NGSO, HD-FDD duplex mode |

Table A.13.1.1.6.1-2: General test parameters for HD-FDD inter frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| NB-IOT operational mode | |  | Standalone |  |
| Satellite information | Config 1 |  | SSC.2 for nCell1  NSC.2 for nCell2 | NGSO |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| T2 end condition | Active cell |  | nCell2 |  |
| Neighbour cells |  | nCell1 |  |
| E-UTRA RF Channel Number | |  | 1 | One carrier frequency is used for eCell. |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T0 | | s | 5 | During T0, UE decodes SIB3-NB and SIB5-NB to acquire the inter-frequency carrier information. |
| T1 | | s | >7 | During T1, nCell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that nCell2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 70 | T2 is defined so that cell re-selection time is taken into account. |

Table A.13.1.1.6.1-3: nCell 1, nCell 2 specific test parameters for HD-FDD inter frequency cell reselection test case for Cat-NB1 UE in enhanced coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | nCell 1 | | | nCell 2 | | |
|  |  | T0 | T1 | T2 | T0 | T1 | T2 |
| BWchannel | kHz | 180 | | | 180 | | |
| NPBCH\_RA | dB | 0 | | | 0 | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -156 | | | -156 | | |
| Pcompensation | dB | 0 | | | 0 | | |
| Qhysts | dB | 0 | | | 0 | | |
| Qoffsets, n | dB | 0 | | | 0 | | |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | NRSRP | | | NRSRP | | |
|  | dBm/15 kHz | -98 | | | | | |
|  | dB | 10 | -12 | -12 | -infinity | -infinity | -2.7 |
| Note2 | dB | 10 | -12 | -12 | -infinity | -infinity | -2.7 |
| NRSRP Note2 | dBm/15 kHz | -88 | -110 | -110 | -infinity | -infinity | -100.7 |
| Treselection | s | 0 | | | 0 | | |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to nCell 1 | ms | 0 | | | | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.13.1.1.6.2 Test Requirements

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

The cell re-selection delay to a newly detectable cell shall be less than 66.32 s.

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,NB\_Inter\_EC + TSI, and to an already detected cell can be expressed as: Tevaluate, NB\_Inter\_EC + TSI,

Where:

Tdetect,NB\_Inter\_EC See Table 4.6A.2.6-1 in clause 4.6A.2.6

Tevaluate, NB\_Inter\_EC See Table 4.6A.2.6-1 in clause 4.6A.2.6

TSI Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 8.32 s is assumed in this test case.

This gives a total of 66.32 s, allow 67 s for the cell re-selection delay to a newly detectable cell.

## <<< NEXT CHANGE >>>

## A.13.3 RRC connection mobility control for satellite access

### A.13.3.1 RRC re-establishment for satellite access

#### A.13.3.1.1 HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in Standalone mode under normal coverage

##### A.13.3.1.1.1 Test Purpose and Environment

The purpose is to verify that the NB-IoT FDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements for Cat-NB1 UE in clause 6.5A.

The test parameters are given in table A.13.3.1.1.1-1 and table A.13.3.1.1.1-2 below. nCell1 and nCell2 are NB-IoT cells with different physical cell ID on the same frequency carrier. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

The UE shall be provided with the valid information about the SAN serving cells before the test.

Table A.13.3.1.1.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

Table A.13.3.1.1.1-2: General test parameters for HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in Standalone mode under normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| NB-IOT operational mode | |  | Standalone |  |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| Final condition | Active cell |  | nCell2 |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| NPDCCH repetition level | |  | 16 | NPDCCH Rmax |
| N310 | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | Ms | 0 | Radio link failure timer; T310 is disabled |
| T311 | | Ms | 15000 | RRC re-establishment timer |
| DRX | |  | OFF |  |
| T1 | | S | 5 |  |
| T2 | | Ms | 400 |  |
| T3 | | S | 15 |  |

Table A.13.3.1.1.1-3: nCell 1, nCell 2 specific test parameters for HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in Standalone mode under normal coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **nCell 1** | | | **nCell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| BWchannel | kHz | 200 | | | 200 | | |
| NPDSCH parameters |  | R.18 HD-FDD | | | R.18 HD-FDD | | |
| NPDCCH parameters |  | R.30 HD-FDD | | | R.30 HD-FDD | | |
| NOCNG Patterns |  | NOP.3 FDD | | | NOP.3 FDD | | |
| NPBCH\_RA | dB | 0 | | | 0 | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
|  | dBm/15 kHz | 98 | | | | | |
|  | dB | 7 | -Infinity | -Infinity | -Infinity | 4 | 4 |
| Note2 | dB | 7 | -Infinity | -Infinity | -Infinity | 4 | 4 |
| NRSRP Note2 | dBm/15 kHz | -91 | -Infinity | -Infinity | -Infinity | -94 | -94 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to nCell 1 | ms | - | | | 3 | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.13.3.1.1.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send NPRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown NB-IoT FDD intra frequency cell shall be less than 10.6 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE-re-establish\_delay\_NB-IoT.

Where:

- TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

- TUE-re-establish\_delay\_NB-IoT = 100 ms + NNB-Iot-freq\*Tsearch\_NB-IoT + TSI\_NB-IoT + TPRACH\_NB-IoT

- NNB-Iot-freq = 1

- Tsearch\_NB-IoT = 1400 ms

- TSI\_NB-IoT = 8320 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

- TPRACH\_NB-IoT = 80 ms; it is the additional delay caused by the random access procedure.

#### A.13.3.1.2 HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in Standalone mode under enhanced coverage

##### A.13.3.1.2.1 Test Purpose and Environment

The purpose is to verify that the NB-IoT FDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements for Cat-NB1 UE in clause 6.5A.

The test parameters are given in table A.13.3.1.2.1-1 and table A.13.3.1.2.1-2 below. nCell1 and nCell2 are NB-IoT cells with different physical cell ID on the same frequency carrier. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

The UE shall be provided with the valid information about the SAN serving cells before the test.

Table A.13.3.1.2.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

Table A.13.3.1.2.1-2: General test parameters for HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in Standalone mode under enhanced coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| NB-IOT operational mode | |  | Standalone |  |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| Final condition | Active cell |  | nCell2 |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| NPDCCH repetition level | |  | 16 | NPDCCH Rmax |
| N310 | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | Ms | 0 | Radio link failure timer; T310 is disabled |
| T311 | | Ms | 60000 | RRC re-establishment timer |
| DRX | |  | OFF |  |
| T1 | | S | 5 |  |
| T2 | | Ms | 400 |  |
| T3 | | S | 60 |  |

Table A.13.3.1.2.1-3: nCell 1, nCell 2 specific test parameters for HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in Standalone mode under enhanced coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **nCell 1** | | | **nCell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| BWchannel | kHz | 200 | | | 200 | | |
| NPDSCH parameters |  | R.18 HD-FDD | | | R.18 HD-FDD | | |
| NPDCCH parameters |  | R.30 HD-FDD | | | R.30 HD-FDD | | |
| NOCNG Patterns |  | NOP.3 FDD | | | NOP.3 FDD | | |
| NPBCH\_RA | dB | 0 | | | 0 | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
|  | dBm/15 kHz | 98 | | | | | |
|  | dB | 7 | -Infinity | -Infinity | -Infinity | -12.6 | -12.6 |
| Note2 | dB | 7 | -Infinity | -Infinity | -Infinity | -12.6 | -12.6 |
| NRSRP Note2 | dBm/15 kHz | -91 | -Infinity | -Infinity | -Infinity | -110.6 | -110.6 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to nCell 1 | ms | - | | | 3 | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.13.3.1.2.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send NPRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown NB-IoT FDD intra frequency cell shall be less than 58 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE-re-establish\_delay\_NB-IoT.

Where:

- TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

- TUE-re-establish\_delay\_NB-IoT = 100 ms + NNB-Iot-freq\*Tsearch\_NB-IoT + TSI\_NB-IoT + TPRACH\_NB-IoT

- NNB-Iot-freq = 1

- Tsearch\_NB-IoT = 14800 ms

- TSI\_NB-IoT = 41560 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

- TPRACH\_NB-IoT = 1280 ms; it is the additional delay caused by the random access procedure.

## <<< NEXT CHANGE >>>

#### A.13.3.1.3 HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 in Standalone mode under enhanced coverage

##### A.13.3.1.3.1 Test Purpose and Environment

The purpose is to verify that the NB-IoT HD-FDD inter-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements for Cat-NB1 UE in clause 6.5A.

The test parameters are given in table A.13.3.1.3.1-1, table A.13.3.1.3.1-2 and table A.13.3.1.3.1-3 below. nCell1 and nCell2 are NB-IoT cells with different physical cell ID on the different frequency carrier. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure. During T1, the UE shall be indicated with the carrier frequency of nCell 2 to ensure that the UE has the context of the carrier frequency of nCell 2.

Table A.13.3.1.3.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

Table A.13.3.1.3.1-2: General test parameters for HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 in Standalone mode under enhanced coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| NB-IOT operational mode | |  | Standalone |  |
| Satellite information | Config 1 |  | SSC.1 for nCell1  NSC.1 for nCell2 |  |
| Config 2 |  | SSC.2 for nCell1  NSC.2 for nCell2 |  |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| Final condition | Active cell |  | nCell2 |  |
| E-UTRA RF Channel Number | |  | 1 | One carrier frequency is used for eCell1 and eCell2. |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| NPDCCH repetition level | |  | 16 | NPDCCH Rmax |
| N310 | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | Ms | 0 | Radio link failure timer; T310 is disabled |
| T311 | | Ms | 60000 | RRC re-establishment timer |
| DRX | |  | OFF |  |
| T1 | | S | 5 |  |
| T2 | | Ms | 400 |  |
| T3 | | S | 60 |  |

Table A.13.3.1.3.1-3: nCell 1, nCell 2 specific test parameters for HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 in Standalone mode under enhanced coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | nCell 1 | | | nCell 2 | | |
| T1 | T2 | T3 | T1 | T2 | T3 |
| BWchannel | kHz | 200 | | | 200 | | |
| NPDSCH parameters |  | R.18 HD-FDD | | | R.18 HD-FDD | | |
| NPDCCH parameters |  | R.30 HD-FDD | | | R.30 HD-FDD | | |
| NPBCH\_RA | dB | 0 | | | 0 | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
|  | dBm/15 kHz | -98 | | | | | |
|  | dB | 7 | -Infinity | -Infinity | -Infinity | -12.6 | -12.6 |
| Note2 | dB | 7 | -Infinity | -Infinity | -Infinity | -12.6 | -12.6 |
| NRSRP Note2 | dBm/15 kHz | -91 | -Infinity | -Infinity | -Infinity | -110.6 | -110.6 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to nCell 1 | ms | - | | | 3 | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | |

##### A.13.3.1.3.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send NPRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown NB-IoT HD-FDD inter frequency cell shall be less than 58 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE-re-establish\_delay\_NB-IoT.

Where:

- TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

- TUE-re-establish\_delay\_NB-IoT = 100 ms + NNB-Iot-freq\*Tsearch\_NB-IoT + TSI\_NB-IoT + TPRACH\_NB-IoT

- NNB-Iot-freq = 1

- Tsearch\_NB-IoT = 14800 ms

- TSI\_NB-IoT = 41560 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

- TPRACH\_NB-IoT = 1280 ms; it is the additional delay caused by the random access procedure.

## <<< NEXT CHANGE >>>

## A.13.5 UE measurement procedures in RRC\_CONNECTED state for UE category NB1 for satellite access

A.13.5.1 HD-FDD Intra-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage for Satellite Access

A.13.5.1.1 Test Purpose and Environment

The purpose is to verify that the NB-IoT intra-frequency neighbour cell measurement requirement in clause 8.14A.6.3 is met.

The test parameters are given in table A.13.5.1.1-1, table A.13.5.1.1-2 and table A.13.5.1.1-3 below. nCell1 and nCell2 are NB-IoT cells with different physical cell ID on the same frequency carrier. The test consists of 5 successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively.

Table A.13.5.1.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.13.5.1.1-2: General test parameters for HD-FDD Intra-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage for Satellite Access**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| NB-IOT operational mode | |  | standalone |  |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| Final condition | Active cell |  | nCell2 |  |
| Satellite information | Config 1 |  | SSC.1 |  |
| Config 2 |  | SSC.2 |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| NPRACH Configuration | |  | NPRACH.R-1 | Refer to A.3.18 |
| NPDCCH repetition level | |  | 8 | NPDCCH Rmax |
| N310 | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | ms | 0 | Radio link failure timer; T310 is disabled |
| T311-v13xy | | ms | 15000 | RRC re-establishment timer |
| DRX | |  | OFF |  |
| T1 | | ms | 5000 |  |
| T2 | | ms | 900 |  |
| T3 | | ms | 3100 |  |
| T4 | | ms | 500 |  |
| T5 | | ms | 8520 |  |
| s-MeasureIntra | | dBm | -95 |  |
| s-MeasureDeltaP | | dB | 6 |  |
| t-MeasureDeltaP | | s | 60 |  |

**Table A.13.5.1.1-3: General test parameters for HD-FDD Intra-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **nCell 1** | | | | | **nCell 2** | | | | |
| **T1** | **T2** | **T3** | **T4** | **T5** | **T1** | **T2** | **T3** | **T4** | **T5** |
| BWchannel | kHz | 200 | | | | | 200 | | | | |
| NPDSCH parameters |  | R.18 HD-FDD | | | | | R.18 HD-FDD | | | | |
| NPDCCH parameters |  | R.30 HD-FDD | | | | | R.30 HD-FDD | | | | |
| NOCNG Patterns |  | NOP.3 FDD | | | | | NOP.3 FDD | | | | |
| NPBCH\_RA | dB | 0 | | | | | 0 | | | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
|  | dBm/15 kHz | -98 | | | | | | | | | |
|  | dB | 9 | -3 | -8.5 | -Infinity | -Infinity | -Infinity | -Infinity | 2.2 | 4 | 4 |
| Note2 | dB | 9 | -3 | -8.5 | -Infinity | -Infinity | -Infinity | -Infinity | 2.2 | 4 | 4 |
| NRSRP Note2 | dBm/15 kHz | -89 | -101 | -101 | -Infinity | -Infinity | -Infinity | -Infinity | -94 | -94 | -94 |
| Propagation Condition |  | AWGN | | | | | AWGN | | | | |
| Antenna Configuration |  | 1x1 | | | | | 1x1 | | | | |
| Timing offset to nCell 1 | ms | - | | | | | 3 | | | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | | | |

A.13.5.1.2 Test Requirements

UE shall trigger RLF during T4 and complete neighbour cell measurement before end of T4. UE shall start to send NPRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 before the end of T5 to fulfil the RRC re-establishment delay to a known NB-IoT FDD intra frequency cell.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE-re-establish\_delay\_NB-IoT.

Where:

- TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

- TUE-re-establish\_delay\_NB-IoT = 100 ms + NNB-Iot-freq\*Tsearch\_NB-IoT + TSI\_NB-IoT + TPRACH\_NB-IoT

- NNB-Iot-freq = 1

- Tsearch\_NB-IoT = 0 ms

- TSI\_NB-IoT = 8320 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

- TPRACH\_NB-IoT = 80 ms; it is the additional delay caused by the random access procedure.

A.13.5.2 HD-FDD Inter-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage for Satellite Access

A.13.5.2.1 Test Purpose and Environment

The purpose is to verify that the NB-IoT inter-frequency neighbour cell measurement requirement in clause 8.14A.6.3 is met.

The test parameters are given in table A.13.5.2.1-1, table A.13.5.2.1-2, table A.13.5.2.1-3 and table A.13.5.2.1-4 below. nCell1 and nCell2 are NB-IoT cells with different physical cell ID on the different frequency carriers. The test consists of 5 successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively.

Table A.13.5.2.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.13.5.2.1-2: General test parameters for HD-FDD Inter-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage for Satellite Access**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| NB-IOT operational mode | |  | standalone |  |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| Final condition | Active cell |  | nCell2 |  |
| Satellite information | Config 1 |  | SSC.1 |  |
| Config 2 |  | SSC.2 |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| NPRACH Configuration | |  | NPRACH.R-1 | Refer to A.3.18 |
| NPDCCH repetition level | |  | 8 | NPDCCH Rmax |
| N310 | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | ms | 0 | Radio link failure timer; T310 is disabled |
| T311-v13xy | | ms | 15000 | RRC re-establishment timer |
| DRX | |  | OFF |  |
| T1 | | ms | 5000 |  |
| T2 | | ms | 1300 |  |
| T3 | | ms | 8500 |  |
| T4 | | ms | 5200 |  |
| T5 | | ms | 8520 |  |
| s-MeasureInter | | dBm | -95 |  |
| s-MeasureDeltaP | | dB | 6 |  |
| t-MeasureDeltaP | | s | 60 |  |

**Table A.13.5.2.1-3: General test parameters for HD-FDD Inter-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage for Satellite Access**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **nCell 1** | | | | | **nCell 2** | | | | |
| **T1** | **T2** | **T3** | **T4** | **T5** | **T1** | **T2** | **T3** | **T4** | **T5** |
| BWchannel | kHz | 200 | | | | | 200 | | | | |
| NPDSCH parameters |  | R.18 HD-FDD | | | | | R.18 HD-FDD | | | | |
| NPDCCH parameters |  | R.30 HD-FDD | | | | | R.30 HD-FDD | | | | |
| NOCNG Patterns |  | NOP.3 FDD | | | | | NOP.3 FDD | | | | |
| NPBCH\_RA | dB | 0 | | | | | 0 | | | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
|  | dBm/15 kHz | -98 | | | | | | | | | |
|  | dB | 9 | -3 | -3 | -Infinity | -Infinity | -Infinity | -Infinity | 4 | 4 | 4 |
| Note2 | dB | 9 | -3 | -3 | -Infinity | -Infinity | -Infinity | -Infinity | 4 | 4 | 4 |
| NRSRP Note2 | dBm/15 kHz | -89 | -101 | -101 | -Infinity | -Infinity | -Infinity | -Infinity | -94 | -94 | -94 |
| Propagation Condition |  | AWGN | | | | | AWGN | | | | |
| Antenna Configuration |  | 1x1 | | | | | 1x1 | | | | |
| Timing offset to nCell 1 | ms | - | | | | | 3 | | | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | | | |

Table A.13.5.2.1-4: DRX-Configuration for HD-FDD Inter-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage for Satellite Access

|  |  |  |
| --- | --- | --- |
| Field | Value | Comment |
| onDurationTimer | pp1 | As specified in clause 6.7.3 in TS 36.331 |
| drx-InactivityTimer | pp0 |
| drx-RetransmissionTimer | pp0 |
| drx-StartOffset | 0 |

A.13.5.2.2 Test Requirements

UE shall trigger RLF during T4 and complete neighbour cell measurement before end of T4. UE shall start to send NPRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 before the end of T5 to fulfil the RRC re-establishment delay to a known NB-IoT FDD inter frequency cell.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE-re-establish\_delay\_NB-IoT.

Where:

- TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

- TUE-re-establish\_delay\_NB-IoT = 100 ms + NNB-Iot-freq\*Tsearch\_NB-IoT + TSI\_NB-IoT + TPRACH\_NB-IoT

- NNB-Iot-freq = 1

- Tsearch\_NB-IoT = 0 ms

- TSI\_NB-IoT = 8320 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

- TPRACH\_NB-IoT = 80 ms; it is the additional delay caused by the random access procedure.

A.13.5.3 HD-FDD Intra-frequency location-based neighbour cell measurement for UE category NB1 in standalone mode under normal coverage for Satellite Access

A.13.5.3.1 Test Purpose and Environment

The purpose is to verify that the NB-IoT intra-frequency neighbour cell measurement requirement in clause 8.14A.6.3 is met.

The test parameters are given in table A.13.5.3.1-1, table A.13.5.3.1-2 and table A.13.5.3.1-3 below. nCell1 and nCell2 are NB-IoT cells with different physical cell ID on the same frequency carrier. The test consists of 4 successive time periods, with time duration of T1, T2, T3, T4 respectively.

At the start of T2, the UE location is changed such that the distance to the reference location broadcasted in SystemInformationBlockType31-NB of nCell 1 is exceeded by the configured value in *distanceThresh* plus 50m.

Table A.13.5.3.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.13.5.3.1-2: General test parameters for HD-FDD Intra-frequency location-based neighbour cell measurement for UE category NB1 in standalone mode under normal coverage for Satellite Access**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| NB-IOT operational mode | |  | standalone |  |
| Initial condition | Active cell |  | nCell1 |  |
| Neighbour cells |  | nCell2 |  |
| Final condition | Active cell |  | nCell2 |  |
| Satellite information | Config 1 |  | SSC.1 |  |
| Config 2 |  | SSC.2 |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| NPRACH Configuration | |  | NPRACH.R-1 | Refer to A.3.18 |
| NPDCCH repetition level | |  | 8 | NPDCCH Rmax |
| N310 | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | ms | 0 | Radio link failure timer; T310 is disabled |
| T311-v13xy | | ms | 15000 | RRC re-establishment timer |
| DRX | |  | OFF |  |
| T1 | | ms | 5000 |  |
| T2 | | ms | 3100 |  |
| T3 | | ms | 500 |  |
| T4 | | ms | 8520 |  |
| s-MeasureIntra | | dBm | -95 |  |
| s-MeasureDeltaP | | dB | 6 |  |
| t-MeasureDeltaP | | s | 60 |  |

**Table A.13.5.3.1-3: General test parameters for HD-FDD** **location-based Intra-frequency neighbour cell measurement for UE category NB1 in standalone mode under normal coverage**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **nCell 1** | | | | **nCell 2** | | | |
| **T1** | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** |
| BWchannel | kHz | 200 | | | | 200 | | | |
| NPDSCH parameters |  | R.18 HD-FDD | | | | R.18 HD-FDD | | | |
| NPDCCH parameters |  | R.30 HD-FDD | | | | R.30 HD-FDD | | | |
| NOCNG Patterns |  | NOP.3 FDD | | | | NOP.3 FDD | | | |
| NPBCH\_RA | dB | 0 | | | | 0 | | | |
| NPBCH\_RB | dB |
| NPSS\_RA | dB |
| NSSS\_RA | dB |
| NPDCCH\_RA | dB |
| NPDCCH\_RB | dB |
| NPDSCH\_RA | dB |
| NPDSCH\_RB | dB |
| NOCNG\_RANote 1 | dB |
| NOCNG\_RBNote 1 | dB |
|  | dBm/15 kHz | -98 | | | | | | | |
|  | dB | 9 | 3.5 | -Infinity | -Infinity | -Infinity | -5.5 | 4 | 4 |
| Note2 | dB | 9 | 3.5 | -Infinity | -Infinity | -Infinity | -5.5 | 4 | 4 |
| NRSRP Note2 | dBm/15 kHz | -89 | -89 | -Infinity | -Infinity | -Infinity | -94 | -94 | -94 |
| Propagation Condition |  | AWGN | | | | AWGN | | | |
| Antenna Configuration |  | 1x1 | | | | 1x1 | | | |
| Timing offset to nCell 1 | ms | - | | | | 3 | | | |
| Note 1: NOCNG 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: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | |

A.13.5.3.2 Test Requirements

UE shall trigger RLF during T3 and complete neighbour cell measurement before end of T3. UE shall start to send NPRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 before the end of T4 to fulfil the RRC re-establishment delay to a known NB-IoT FDD intra frequency cell.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE-re-establish\_delay\_NB-IoT.

Where:

- TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

- TUE-re-establish\_delay\_NB-IoT = 100 ms + NNB-Iot-freq\*Tsearch\_NB-IoT + TSI\_NB-IoT + TPRACH\_NB-IoT

- NNB-Iot-freq = 1

- Tsearch\_NB-IoT = 0 ms

- TSI\_NB-IoT = 8320 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

- TPRACH\_NB-IoT = 80 ms; it is the additional delay caused by the random access procedure.

## <<< NEXT CHANGE >>>

# A.14 E-UTRAN Standalone Tests for UE Category M1 for Satellite Access

## A.14.1 RRC\_IDLE state for satellite access

### A.14.1.1 Cell re-selection for satellite access

#### A.14.1.1.1 E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage

##### A.14.1.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency cell reselection requirements for category M1 UE in normal coverage specified in clause 4.7A.2.1.2.

The supported test configurations are provided in Table A.14.1.1.1.1-1.

Table A.14.1.1.1.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GEO/GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.14.1.1.1.1-2 and A.14.1.1.1.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

Table A.14.1.1.1.1-2: General test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial condition | Active cell |  | Cell1 |  |
| Neighbour cells |  | Cell2 |  |
| T2 end condition | Active cell |  | Cell2 |  |
| Neighbour cells |  | Cell1 |  |
| Final condition | Visited cell |  | Cell1 |  |
| E-UTRA RF Channel Number | |  | 1 | Only one FDD carrier frequency is used. |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH Configuration | |  | PRACH\_2CE | Refer to A.3.16 |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 40 | T2 need to be defined so that cell re-selection reaction time is taken into account. |
| T3 | | s | 15 | T3 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.1.1-3: Cell specific test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | | | |
| BWchannel | MHz | 1.4 | | | | | |
| OCNG Patterns |  | OP.6 FDD | | | OP.6 FDD | | |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -140 | -140 | -140 | -140 | -140 | -140 |
| Pcompensation | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qhysts | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qoffsets, n | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | RSRP | | | RSRP | | |
| Note2 | dBm/15 kHz | -98 | | | | | |
|  | dB | 16 | 12 | 16 | -infinity | 16 | 12 |
|  | dB | 16 | -4.11 | 3.73 | -infinity | 3.73 | -4.11 |
| RSRP Note3 | dBm/15 kHz | -82 | -86 | -82 | -infinity | -82 | -86 |
| Treselection | s | 0 | 0 | 0 | 0 | 0 | 0 |
| Sintrasearch | dB | Not sent | | | Not sent | | |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1 | ms | - | | | 3 | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources 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. | | | | | | | |

##### A.14.1.1.1.2 Test Requirements

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

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

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

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

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,EUTRAN\_Intra\_NC + TSI-EUTRA-M1-NC, and to an already detected cell can be expressed as: Tevaluate,EUTRAN\_Intra\_NC + TSI-EUTRA-M1-NC,

Where:

Tdetect,EUTRAN\_Intra\_NC See Table 4.7A.2.1.2-1 in clause 4.7A.2.1

Tevaluate,EUTRAN\_Intra\_NC  See Table 4.7A.2.1.2-1 in clause 4.7A.2.1

TSI-EUTRA-M1-NC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; [1280] ms is assumed in this test case. This include the time to acquire satellite assistance information (ephemeris, common delay, etc) conveyed in NB-SystemInformation-31, when the test is performed for configuration 1 (GSO) and no satellite assistance information is conveyed for the target cell by the current serving cell.

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

#### A.14.1.1.2 E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in normal coverage

##### A.14.1.1.2.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency cell reselection requirements for Cat-M1 UE specified in clause 4.7A.2.1.2.

The supported test configurations are provided in Table A.14.1.1.2.1-1.

Table A.14.1.1.1.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

The test scenario comprises of 1 E-UTRA carrier and 2 cells as given in tables A.14.1.1.2.1-2 and A.14.1.1.2.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

Table A.14.1.1.2.1-2: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial condition | Active cell |  | Cell1 |  |
| Neighbour cells |  | Cell2 |  |
| T2 end condition | Active cell |  | Cell2 |  |
| Neighbour cells |  | Cell1 |  |
| Final condition | Visited cell |  | Cell1 |  |
| E-UTRA RF Channel Number | |  | 1 | Only one carrier frequency is used. |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH Configuration | |  | PRACH\_2CE | Refer to A.3.16 |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 40 | T2 need to be defined so that cell re-selection reaction time is taken into account. |
| T3 | | s | 15 | T3 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.2.1-3: Cell specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | | | |
| BWchannel | MHz | 1.4 | | | | | |
| OCNG Patterns |  | OP.6 FDD | | | OP.6 FDD | | |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -140 | -140 | -140 | -140 | -140 | -140 |
| Pcompensation | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qhysts | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qoffsets, n | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | RSRP | | | RSRP | | |
| Note2 | dBm/15 kHz | -98 | | | | | |
|  | dB | 16 | 12 | 16 | -infinity | 16 | 12 |
|  | dB | 16 | -4.11 | 3.73 | -infinity | 3.73 | -4.11 |
| RSRP Note3 | dBm/15 kHz | -82 | -86 | -82 | -infinity | -82 | -86 |
| Treselection | s | 0 | 0 | 0 | 0 | 0 | 0 |
| Sintrasearch | dB | Not sent | | | Not sent | | |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1 | ms | - | | | 3 | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources 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. | | | | | | | |

##### A.14.1.1.2.2 Test Requirements

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

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

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

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

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,EUTRAN\_Intra\_NC + TSI-EUTRA-M1-NC, and to an already detected cell can be expressed as: Tevaluate,EUTRAN\_Intra\_NC + TSI-EUTRA-M1-NC,

Where:

Tdetect,EUTRAN\_Intra\_NC See Table 4.7A.2.1.2-1 in clause 4.7A.2.1

Tevaluate,EUTRAN\_Intra\_NC  See Table 4.7A.2.1.2-1 in clause 4.7A.2.1

TSI-EUTRA-M1-NC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; [1280] ms is assumed in this test case. This include the time to acquire satellite assistance information (ephemeris, common delay, etc) conveyed in NB-SystemInformation-31, when the test is performed for configuration 1 (GSO) and no satellite assistance information is conveyed for the target cell by the current serving cell.

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

#### A.14.1.1.3 E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage with serving cell RRM measurement relaxation

##### A.14.1.1.3.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency cell reselection requirements for category M1 UE in normal coverage specified in clause 4.2.2.3 when UE is configured to monitor WUS according to Table A.14.1.1.3.1-2 and under the serving cell RRM measurement relaxation according to the subclause 4.7A.2.1.1A and under the intra-frequency neighbor cell measurement relaxation according to the subclause 4.7A.2.1.2.

The supported test configurations are provided in Table A.14.1.1.1.1-1.

Table A.14.1.1.1.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.14.1.1.3.1-2 and A.14.1.1.3.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

Table A.14.1.1.3.1-2: General test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial condition | Active cell |  | Cell1 |  |
| Neighbour cells |  | Cell2 |  |
| T2 end condition | Active cell |  | Cell2 |  |
| Neighbour cells |  | Cell1 |  |
| Final condition | Visited cell |  | Cell1 |  |
| E-UTRA RF Channel Number | |  | 1 | Only one FDD carrier frequency is used. |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH Configuration | |  | PRACH\_2CE | Refer to A.3.16 |
| Rmax | |  | [128] |  |
| maxDurationFactor | |  | [one4th] | WUS config. Wmax = 32 (=1/4\*Rmax) |
| numPOs | |  | [n1] | WUS config. Single PO mapped to each WUS occasion |
| timeOffsetDRX | |  | [ms40] | WUS config. Gap between the end of WUS duration to the associated PO |
| numDRX-CycleRelaxed | |  | 8 | Serving cell RRM measurement is relaxed by |
| DRX cycle length | | s | 0.64 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 40 | T2 need to be defined so that cell re-selection reaction time is taken into account. |
| T3 | | s | 15 | T3 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.3.1-3: Cell specific test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | | | |
| BWchannel | MHz | 1.4 | | | | | |
| OCNG Patterns |  | OP.6 FDD | | | OP.6 FDD | | |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -140 | -140 | -140 | -140 | -140 | -140 |
| Pcompensation | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qhysts | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qoffsets, n | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | RSRP | | | RSRP | | |
| Note2 | dBm/15 kHz | -98 | | | | | |
|  | dB | 16 | 12 | 16 | -infinity | 16 | 12 |
|  | dB | 16 | -4.11 | 3.73 | -infinity | 3.73 | -4.11 |
| RSRP Note3 | dBm/15 kHz | -82 | -86 | -82 | -infinity | -82 | -86 |
| Treselection | s | 0 | 0 | 0 | 0 | 0 | 0 |
| Sintrasearch | dB | Not sent | | | Not sent | | |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1 | ms | - | | | 3 | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources 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. | | | | | | | |

##### A.14.1.1.3.2 Test Requirements

Before the beginning of T2, UE is under relaxed monitoring where the serving cell measurement is performed every 5.12 s and the infra-frequency measurement for the neighbor cells is relaxed according to subclause 5.2.4.12.0 in TS 36.304 [1].

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

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

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

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

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,EUTRAN\_Intra\_NC + TSI-EUTRA-M1-NC, and to an already detected cell can be expressed as: Tevaluate,EUTRAN\_Intra\_NC + TSI-EUTRA-M1-NC,

Where:

Tdetect,EUTRAN\_Intra\_NC See Table 4.7A.2.1.2-1 in clause 4.7A.2.1 based on the configured DRX cycle

Tevaluate,EUTRAN\_Intra\_NC  See Table 4.7A.2.1.2-1 in clause 4.7A.2.1 based on the effective DRX cycle after relaxation; [TBD] s is assumed in this test case.

TSI-EUTRA-M1-NC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; [1280] ms is assumed in this test case. This include the time to acquire satellite assistance information (ephemeris, common delay, etc) conveyed in NB-SystemInformation-31, when the test is performed for configuration 1 (GSO) and no satellite assistance information is conveyed for the target cell by the current serving cell.

This gives a total of [TBD] s, allow [TBD] s for the cell re-selection delay to a newly detectable cell and [TBD] s, allow [TBD] s for the cell re-selection delay to an already detected cell in the test case.

#### A.14.1.1.4 E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in normal coverage with serving cell RRM measurement relaxation

##### A.14.1.1.4.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency cell reselection requirements for Cat-M1 UE specified in clause 4.2.2.3 when UE is configured to monitor WUS according to Table A.14.1.1.4.1-2 and under the serving cell RRM measurement relaxation according to the subclause 4.7.2.1.1A and under the intra-frequency neighbor cell measurement relaxation according to the subclause 4.7.2.1.2.

The test scenario comprises of 1 E-UTRA carrier and 2 cells as given in tables A.14.1.1.4.1-2 and A.14.1.1.4.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

Table A.14.1.1.4.1-2: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial condition | Active cell |  | Cell1 |  |
| Neighbour cells |  | Cell2 |  |
| T2 end condition | Active cell |  | Cell2 |  |
| Neighbour cells |  | Cell1 |  |
| Final condition | Visited cell |  | Cell1 |  |
| E-UTRA RF Channel Number | |  | 1 | Only one carrier frequency is used. |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH Configuration | |  | PRACH\_2CE | Refer to A.3.16 |
| Rmax | |  | [128] |  |
| maxDurationFactor | |  | [one4th] | WUS config. Wmax = 32 (=1/4\*Rmax) |
| numPOs | |  | [n1] | WUS config. Single PO mapped to each WUS occasion |
| timeOffsetDRX | |  | [ms40] | WUS config. Gap between the end of WUS duration to the associated PO |
| numDRX-CycleRelaxed | |  | [4] | Serving cell RRM measurement is relaxed by |
| DRX cycle length | | s | 0.64 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 40 | T2 need to be defined so that cell re-selection reaction time is taken into account. |
| T3 | | s | 15 | T3 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.4.1-3: Cell specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | | | |
| BWchannel | MHz | 10 | | | | | |
| OCNG Patterns |  | OP.6 FDD | | | OP.6 FDD | | |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | -140 | -140 | -140 | -140 | -140 | -140 |
| Pcompensation | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qhysts | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Qoffsets, n | dB | 0 | 0 | 0 | 0 | 0 | 0 |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | RSRP | | | RSRP | | |
| Note2 | dBm/15 kHz | -98 | | | | | |
|  | dB | 16 | 12 | 16 | -infinity | 16 | 12 |
|  | dB | 16 | -4.11 | 3.73 | -infinity | 3.73 | -4.11 |
| RSRP Note3 | dBm/15 kHz | -82 | -86 | -82 | -infinity | -82 | -86 |
| Treselection | s | 0 | 0 | 0 | 0 | 0 | 0 |
| Sintrasearch | dB | Not sent | | | Not sent | | |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1 | ms | - | | | 3 | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources 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. | | | | | | | |

##### A.14.1.1.4.2 Test Requirements

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

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

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

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

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,EUTRAN\_Intra\_NC + TSI-EUTRA-M1-NC, and to an already detected cell can be expressed as: Tevaluate,EUTRAN\_Intra\_NC + TSI-EUTRA-M1-NC,

Where:

Tdetect,EUTRAN\_Intra\_NC See Table 4.7A.2.1.2-1 in clause 4.7A.2.1 based on the configured DRX cycle

Tevaluate,EUTRAN\_Intra\_NC  See Table 4.7A.2.1.2-1 in clause 4.7A.2.1 based on the effective DRX cycle after relaxation; [TBD] s is assumed in this test case.

TSI-EUTRA-M1-NC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; [1280] ms is assumed in this test case. This include the time to acquire satellite assistance information (ephemeris, common delay, etc) conveyed in NB-SystemInformation-31, when the test is performed for configuration 1 (GSO) and no satellite assistance information is conveyed for the target cell by the current serving cell.

This gives a total of [TBD] s, allow [TBD] s for the cell re-selection delay to a newly detectable cell and [TBD] s, allow [TBD] s for the cell re-selection delay to an already detected cell in the test case.

## <<< NEXT CHANGE >>>

#### A.14.1.1.5 E-UTRAN FDD – FDD Inter frequency case for Cat-M1 UE in normal coverage

##### A.14.1.1.5.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD inter frequency cell reselection requirements for category M1 UE in normal coverage for satellite access specified in clause 4.7A.2.1.3.

The supported test configurations are provided in Table A.14.1.1.5.1-1.

Table A.14.1.1.5.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test scenario comprises of 2 E-UTRA FDD cells on 2 different carriers as given in tables A.14.1.1.5.1-2 and A.14.1.1.5.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.14.1.1.5.1-2: General test parameters for FDD-FDD inter frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial condition | Active cell |  | Cell2 | UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase |
| T1 end condition | Active cell |  | Cell1 | UE shall perform reselection to cell 1 during T1 |
| Neighbour cell |  | Cell2 |  |
| Final condition | Active cell |  | Cell2 | UE shall perform reselection to cell 2 during T3 |
| E-UTRA RF Channel Number | |  | 1, 2 | Two FDD carrier frequencies are used. |
| PRACH configuration | |  | PRACH\_2CE | See table in A.3.16 |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T1 | | s | 15 | T1 need to be defined so that cell re-selection reaction time is taken into account. |
| T2 | | s | >7 | During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3. |
| T3 | | s | 75 | T3 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.5.1-3: Cell specific test parameters for FDD-FDD inter frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | | | Cell 2 | | |
| T1 | T2 | T3 | | T1 | T2 | T3 |
| Satellite information |  | 1 | NSC.1 | SSC.1 | SSC.1 | | SSC.1 | NSC.1 | NSC.1 |
|  |  | 2 | NSC.2 | SSC.2 | SSC.2 | | SSC.2 | NSC.2 | NSC.2 |
| E-UTRA RF Channel number |  | 1, 2 | 1 | | | | 2 | | |
| BWchannel | MHz | 1, 2 | 1.4 | | | | 1.4 | | |
| OCNG Patterns defined in A.3.2.1.6 |  | 1, 2 | OP.7 FDD | | | | OP.7 FDD | | |
| PBCH\_RA | dB | 1, 2 | -3 | | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB |  |
| dB |  |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |  |  |  |  |  |  |  |  |
| Qrxlevmin | dBm | 1, 2 | -140 | | | | -140 | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | | | | |
|  | dB | 1, 2 | 14 | 14 | 14 | | -4 | -infinity | 12 |
|  | dB | 1, 2 | 14 | 14 | 14 | | -4 | -infinity | 12 |
| RSRP Note 3 | dBm/15 KHz | 1, 2 | -84 | -84 | -84 | | -102 | -infinity | -86 |
| TreselectionEUTRAN | s | 1, 2 | 0 | | | | 0 | | |
| Snonintrasearch | dB | 1, 2 | 50 | | | | Not sent | | |
| Threshx, high | dB | 1, 2 | 48 | | | | 48 | | |
| Threshserving, low | dB | 1, 2 | 44 | | | | 44 | | |
| Threshx, low | dB | 1, 2 | 50 | | | | 50 | | |
| Propagation Condition |  | 1, 2 | AWGN | | | | | | |
| Antenna Configuration |  | 1, 2 | 1x1 | | | 1x1 | | | |
| Timing offset to Cell 1 | ms | 1, 2 | - | | | 3 | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | |

##### A.14.1.1.5.2 Test Requirements

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

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

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

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

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as: Thigher\_priority\_search + Tevaluate, E-UTRAN\_Inter\_NC + TSI-EUTRA-M1-NC , and to lower priority cell can be expressed as: Tevaluate, E-UTRAN\_Inter\_NC + TSI-EUTRA-M1-NC,

Where:

Thigher\_priority\_search See clause 4.7A.2.1.3

Tevaluate, E-UTRAN\_Inter\_NC See Table 4.7A.2.1.3-1 in clause 4.7A.2.1.3

TSI-EUTRA-M1-NC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case provided that SIB31 and SIB33 are scheduled with 80 ms period.

This gives a total of 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

#### A.14.1.1.6 E-UTRAN HD – FDD Inter frequency case for Cat-M1 UE in normal coverage

##### A.14.1.1.6.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD inter frequency cell reselection requirements for category M1 UE in normal coverage for satellite access specified in clause 4.7A.2.1.3.

The supported test configurations are provided in Table A.14.1.1.6.1-1.

Table A.14.1.1.6.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |

The test scenario comprises of 2 E-UTRA carriers and 2 cells as given in tables A.14.1.1.6.1-2 and A.14.1.1.6.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.14.1.1.6.1-2: General test parameters for HD-FDD inter frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial condition | Active cell |  | Cell2 | UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase |
| T1 end condition | Active cell |  | Cell1 | UE shall perform reselection to cell 1 during T1 |
| Neighbour cell |  | Cell2 |  |
| Final condition | Active cell |  | Cell2 | UE shall perform reselection to cell 2 during T3 |
| E-UTRA RF Channel Number | |  | 1, 2 | Two FDD carrier frequencies are used. |
| PRACH configuration | |  | PRACH\_2CE | See table in A.3.16 |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T1 | | s | 15 | T1 need to be defined so that cell re-selection reaction time is taken into account. |
| T2 | | s | >7 | During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3. |
| T3 | | s | 75 | T3 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.6.1-3: Cell specific test parameters for HD-FDD inter frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | | Cell 2 | | |
| T1 | T2 | T3 | T1 | T2 | T3 |
| Satellite information |  | 1 | NSC.1 | SSC.1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  |  | 2 | NSC.2 | SSC.2 | SSC.2 | SSC.2 | NSC.2 | NSC.2 |
| E-UTRA RF Channel number |  | 1, 2 | 1 | | | 2 | | |
| BWchannel | MHz | 1, 2 | 1.4 | | | 1.4 | | |
| OCNG Patterns defined in A.3.2.1.6 |  | 1, 2 | OP.7 FDD | | | OP.7 FDD | | |
| PBCH\_RA | dB | 1, 2 | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB |  |
| dB |  |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |  |  |  |  |  |  |  |
| Qrxlevmin | dBm | 1, 2 | -140 | | | -140 | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | | | |
|  | dB | 1, 2 | 14 | 14 | 14 | -4 | -infinity | 12 |
|  | dB | 1, 2 | 14 | 14 | 14 | -4 | -infinity | 12 |
| RSRP Note 3 | dBm/15 KHz | 1, 2 | -84 | -84 | -84 | -102 | -infinity | -86 |
| TreselectionEUTRAN | s | 1, 2 | 0 | | | 0 | | |
| Snonintrasearch | dB | 1, 2 | 50 | | | Not sent | | |
| Threshx, high | dB | 1, 2 | 48 | | | 48 | | |
| Threshserving, low | dB | 1, 2 | 44 | | | 44 | | |
| Threshx, low | dB | 1, 2 | 50 | | | 50 | | |
| Propagation Condition |  | 1, 2 | AWGN | | | | | |
| Antenna Configuration |  | 1, 2 | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1 | ms | 1, 2 | - | | | 3 | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | |

##### A.14.1.1.6.2 Test Requirements

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

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

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

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

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as: Thigher\_priority\_search + Tevaluate, E-UTRAN\_Inter\_NC + TSI-EUTRA-M1-NC , and to lower priority cell can be expressed as: Tevaluate, E-UTRAN\_Inter\_NC + TSI-EUTRA-M1-NC,

Where:

Thigher\_priority\_search See clause 4.7A.2.1.3

Tevaluate, E-UTRAN\_Inter\_NC See Table 4.7A.2.1.3-1 in clause 4.7A.2.1.3

TSI-EUTRA-M1-NC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case provided that SIB31 and SIB33 are scheduled with 80 ms period.

This gives a total of 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

#### A.14.1.1.7 E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage, time-based triggering

##### A.14.1.1.7.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency cell reselection requirements for category M1 UE in normal coverage for satellite access specified in clause 4.7A.2.1.2.

The supported test configurations are provided in Table A.14.1.1.7.1-1.

Table A.14.1.1.7.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.14.1.1.7.1-2 and A.14.1.1.7.1-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

T-Service broadcasted in SIB3 of Cell 1 is set to the time point that is 36s after start of T2.

Table A.14.1.1.7.1-2: General test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial condition | Active cell |  | Cell1 |  |
| Neighbour cells |  | Cell2 |  |
| T2 end condition | Active cell |  | Cell2 |  |
| Neighbour cells |  | Cell1 |  |
| E-UTRA RF Channel Number | |  | 1 | Only one FDD carrier frequency is used. |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH Configuration | |  | PRACH\_2CE | Refer to A.3.16 |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | 40 | T2 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.7.1-3: Cell specific test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information |  | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  |  | 2 | SSC.2 | SSC.2 | NSC.1 | NSC.2 |
| E-UTRA RF Channel Number |  | 1, 2 | 1 | | | |
| BWchannel | MHz | 1, 2 | 1.4 | | | |
| OCNG Patterns |  | 1, 2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | 1, 2 | -3 | | -3 | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | 1, 2 | -140 | -140 | -140 | -140 |
| Pcompensation | dB | 1, 2 | 0 | 0 | 0 | 0 |
| Qhysts | dB | 1, 2 | 0 | 0 | 0 | 0 |
| Qoffsets, n | dB | 1, 2 | 0 | 0 | 0 | 0 |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | 1, 2 | RSRP | | RSRP | |
| Note2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 16 | 12 | -infinity | 16 |
|  | dB | 1, 2 | 16 | -4.11 | -infinity | 3.73 |
| RSRP Note3 | dBm/15 kHz | 1, 2 | -82 | -86 | -infinity | -82 |
| Treselection | s | 1, 2 | 0 | 0 | 0 | 0 |
| Sintrasearch | dB | 1, 2 | Not sent | | Not sent | |
| Propagation Condition |  | 1, 2 | AWGN | | AWGN | |
| Antenna Configuration |  | 1, 2 | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | ms | 1, 2 | - | | 3 | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

##### A.14.1.1.7.2 Test Requirements

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

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

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,EUTRAN\_Intra\_NC + TSI-EUTRA-M1-NC.

Where:

Tdetect,EUTRAN\_Intra\_NC See Table 4.7A.2.1.2-1 in clause 4.7A.2.1.2

TSI-EUTRA-M1-NC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case provided that SIB3 is scheduled with 20ms period, SIB31 and SIB33 are scheduled with 80 ms period.

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

#### A.14.1.1.8 E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in enhanced coverage, time-based triggering

##### A.14.1.1.8.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency cell reselection requirements for Cat-M1 UE in enhanced coverage for satellite access specified in clause 4.7A.2.2.2.

The supported test configurations are provided in Table A.14.1.1.8.1-1.

Table A.14.1.1.8.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |

The test scenario comprises of 1 E-UTRA carrier and 2 cells as given in tables A.14.1.1.8.1-2 and A.14.1.1.8.1-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

T-Service broadcasted in SIB3 of Cell 1 is set to the time point that is 36s after start of T2.

TableA.14.1.1.8.1-2: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in enhanced coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial condition | Active cell |  | Cell1 |  |
| Neighbour cells |  | Cell2 |  |
| T2 end condition | Active cell |  | Cell2 |  |
| Neighbour cells |  | Cell1 |  |
| E-UTRA RF Channel Number | |  | 1 | Only one carrier frequency is used. |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH Parameters | |  | PRACH\_4CE | Refer to A.3.16 |
| DRX cycle length | | s | 0.64 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | ≤340 | T2 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.8.1-3: Cell specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in enhanced coverage

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information |  | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  |  | 2 | SSC.2 | SSC.2 | NSC.1 | NSC.2 |
| E-UTRA RF Channel Number |  | 1, 2 | 1 | | | |
| BWchannel | MHz | 1, 2 | 1.4 | | | |
| OCNG Patterns |  | 1, 2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | 1, 2 | -3 | | -3 | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | 1, 2 | -140 | -140 | -140 | -140 |
| Pcompensation | dB | 1, 2 | 0 | 0 | 0 | 0 |
| Qhysts | dB | 1, 2 | 0 | 0 | 0 | 0 |
| Qoffsets, n | dB | 1, 2 | 0 | 0 | 0 | 0 |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | 1, 2 | RSRP | | RSRP | |
| Note2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | -7 | -12 | -infinity | -7 |
|  | dB | 1, 2 | -7 | -12.79 | -infinity | -7.27 |
| RSRP Note3 | dBm/15 kHz | 1, 2 | -105 | -110 | -infinity | -105 |
| Treselection | s | 1, 2 | 0 | 0 | 0 | 0 |
| Sintrasearch | dB | 1, 2 | Not sent | | Not sent | |
| Propagation Condition |  | 1, 2 | AWGN | | AWGN | |
| Antenna Configuration |  | 1, 2 | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | ms | 1, 2 | - | | 3 | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

##### A.14.1.1.8.2 Test Requirements

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

The cell re-selection delay to a newly detectable cell shall be less than 338 s.

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,EUTRAN\_Intra\_EC + TSI-EUTRA-M1-EC.

Where:

Tdetect,EUTRAN\_Intra\_EC See Table 4.7A.2.2.2-1 in clause 4.7A.2.2.2.

TSI-EUTRA-M1-EC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case provided that SIB3 is scheduled with 20ms period, SIB31 and SIB33 are scheduled with 80 ms period.

This gives a total of 337.36 s, allow 338 s for the cell re-selection delay to a newly detectable cell in the test case.

#### A.14.1.1.9 E-UTRAN FDD – FDD Inter frequency case for Cat-M1 UE in enhanced coverage, location-based triggering

##### A.14.1.1.9.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD inter frequency cell reselection requirements for category M1 UE in enhanced coverage for satellite access specified in clause 4.7A.2.2.3.

The supported test configurations are provided in Table A.14.1.1.9.1-1.

Table A.14.1.1.9.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test scenario comprises of 2 E-UTRA FDD cells on 2 different carriers as given in tables A.14.1.1.9.1-2 and A.14.1.1.9.1-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

At 4s after the start of T2, the UE location is changed such that the distance to the *referencelocation* broadcasted in SIB31 of Cell 1 is exceeded by the configured value in *distanceThresh* plus 50m.

Table A.14.1.1.9.1-2: General test parameters for FD-FDD inter frequency cell reselection test case for Cat-M1 UE in enhanced coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial condition | Active cell |  | Cell1 |  |
| Neighbour cells |  | Cell2 |  |
| T2 end condition | Active cell |  | Cell2 |  |
| Neighbour cells |  | Cell1 |  |
| E-UTRA RF Channel Number | |  | 1, 2 | Two FDD carrier frequencies are used. |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH Parameters | |  | PRACH\_4CE | Refer to A.3.16 |
| DRX cycle length | | s | 0.64 | The value shall be used for all cells in the test. |
| T1 | | s | >7 | During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2 |
| T2 | | s | ≤340 | T2 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.9.1-3: Cell specific test parameters for FD-FDD inter frequency cell reselection test case for Cat-M1 UE in enhanced coverage

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information |  | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  |  | 2 | SSC.2 | SSC.2 | NSC.1 | NSC.2 |
| E-UTRA RF Channel Number |  | 1, 2 | 1 | | 2 | |
| BWchannel | MHz | 1, 2 | 1.4 | | | |
| OCNG Patterns |  | 1, 2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | 1, 2 | -3 | | -3 | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | 1, 2 | -140 | -140 | -140 | -140 |
| Note2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | -5 | -12 | -infinity | -5 |
|  | dB | 1, 2 | -5 | -12 | -infinity | -5 |
| RSRP Note3 | dBm/15 kHz | 1, 2 | -103 | -110 | -infinity | -103 |
| TreselectionEUTRAN | s | 1, 2 | 0 | 0 | 0 | 0 |
| Snonintrasearch | dB | 1, 2 | 50 | | Not sent | |
| Propagation Condition |  | 1, 2 | AWGN | | AWGN | |
| Antenna Configuration |  | 1, 2 | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | ms | 1, 2 | - | | 3 | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

##### A.14.1.1.9.2 Test Requirements

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

The cell re-selection delay to a newly detectable cell shall be less than 337 s.

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: Tdetect,EUTRAN\_Inter\_EC + TSI-EUTRA-M1-EC.

Where:

Tdetect,EUTRAN\_Inter\_EC See Table 4.7A.2.2.3-1 in clause 4.7A.2.2.3

TSI-EUTRA-M1-EC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case provided that SIB31 and SIB33 are scheduled with 80 ms period.

This gives a total of 336.64 s, allow 337 s for the cell re-selection delay to a newly detectable cell in the test case.

#### A.14.1.1.10 E-UTRAN HD – FDD Inter frequency case for Cat-M1 UE in normal coverage, location-based triggering

##### A.14.1.1.10.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD inter frequency cell reselection requirements for category M1 UE in normal coverage for satellite access specified in clause 4.7A.2.1.3.

The supported test configurations are provided in Table A.14.1.1.10.1-1.

Table A.14.1.1.10.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test scenario comprises of 2 E-UTRA carriers and 2 cells as given in tables Table A.14.1.1.10.1-2 and A.14.1.1.10.1-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of lower priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

At 4s after the start of T2, the UE location is changed such that the distance to the *referencelocation* broadcasted in SIB31 of Cell 2 is exceeded by the configured value in *distanceThresh* plus 50m.

Table A.14.1.1.10.1-2: General test parameters for HD-FDD inter frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| Initial condition | Active cell |  | Cell1 |  |
| T2 end condition | Active cell |  | Cell2 | UE shall perform reselection to cell 2 during T2 |
| Neighbour cell |  | Cell1 |  |
| E-UTRA RF Channel Number | |  | 1, 2 | Two FDD carrier frequencies are used. |
| PRACH configuration | |  | PRACH\_2CE | See table in A.3.16 |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| T1 | | s | >7 |  |
| T2 | | s | 15 | T2 need to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.1.10.1-3: Cell specific test parameters for HD-FDD inter frequency cell reselection test case for Cat-M1 UE in normal coverage

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information |  | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  |  | 2 | SSC.2 | SSC.2 | NSC.1 | NSC.2 |
| E-UTRA RF Channel Number |  | 1, 2 | 1 | | 2 | |
| BWchannel | MHz | 1, 2 | 1.4 | | | |
| OCNG Patterns |  | 1, 2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | 1, 2 | -3 | | -3 | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Qrxlevmin | dBm | 1, 2 | -140 | -140 | -140 | -140 |
| Note2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 14 | -4 | -4 | 14 |
|  | dB | 1, 2 | 14 | -4 | -4 | 14 |
| RSRP Note3 | dBm/15 kHz | 1, 2 | -84 | -102 | -102 | -84 |
| TreselectionEUTRAN | s | 1, 2 | 0 | 0 | 0 | 0 |
| Snonintrasearch | dB | 1, 2 | 50 | | Not sent | |
| Threshx, high | dB | 1, 2 | 48 | | 48 | |
| Threshserving, low | dB | 1, 2 | 44 | | 44 | |
| Threshx, low | dB |  | 50 | | 50 | |
| Propagation Condition |  | 1, 2 | AWGN | | AWGN | |
| Antenna Configuration |  | 1, 2 | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | ms | 1, 2 | - | | 3 | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

##### A.14.1.1.10.2 Test Requirements

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

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

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

NOTE: The cell re-selection delay to lower priority cell can be expressed as: Tevaluate, E-UTRAN\_Inter\_NC + TSI-EUTRA-M1-NC.

Where:

Tevaluate, E-UTRAN\_Inter\_NC See Table 4.7A.2.1.3-1 in clause 4.7A.2.1.3

TSI-EUTRA-M1-NC Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case provided that SIB31 and SIB33 are scheduled with 80 ms period.

This gives a total of 7.68 s for lower priority cell search, allow 8 s for lower priority cell in the test case.

## <<< NEXT CHANGE >>>

## A.14.2 RRC\_CONNECTED state mobility for satellite access

### A.14.2.1 E-UTRAN handover for satellite access

#### A.14.2.1.1 E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition

##### A.14.2.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency handover requirements without SFN acquisition for Satellite Access as specified in clause 5.5A.2.1.

The test configurations are given in Table A.14.2.1.1.1-1. The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.14.2.1.1.1-2 and A.14.2.1.1.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2.

E-UTRAN shall send a RRC message implying handover to Cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. The field sameSFN-Indication and mib-RepetitionStatus are included in the handover command. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search, because the narrowband of the PDSCH Reference Measurement Channel does not overlap with the centre 6 PRBs of the carrier bandwidth.

Table A.14.2.1.1.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, FDD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

**Table A.14.2.1.1.1-2: General test parameters for E-UTRAN FDD-FDD intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 |  |
| Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| Satellite information | Config 1 |  | SSC.1 for Cell1  NSC.1 for Cell2 | GSO |
| Config 2 |  | SSC.2 for Cell1  NSC.2 for Cell2 | NGSO |
| E-UTRA RF Channel Number | |  | 1 | Only one FDD carrier frequency is used. |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.1.1-3: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | | | | | |
| **T1** | **T2** | **T3** | **T1** | | **T2** | | | **T3** | |
| E-UTRA RF Channel Number |  | 1 | | | | | | | | | |
| BWchannel | MHz | 1.4 | | | | | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.48 FDD | R.48 FDD | - | - | - | | | R.48 FDD | | |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.46 FDD | | | R.46 FDD | | | | | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.21 FDD | OP.21 FDD | OP.6 FDD | OP.6 FDD | OP.6 FDD | | | OP.21 FDD | | |
| PBCH\_RA | dB | -3 | | | -3 | | | | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Note 2 | dBm/15 KHz | -98 | | | | | | | | | |
|  | dB | 8 | 8 | 8 | -Infinity | | | 12 | | | 12 |
| Note 3 | dB | 8 | -4.27 | -4.27 | -Infinity | | 3.36 | | | 3.36 | |
| RSRP Note 3 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | | -86 | | | -86 | |
| Propagation Condition |  | AWGN | | | AWGN | | | | | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | | | | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | 3 | | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | | | | | |

##### A.14.2.1.1.2 Test Requirements

The UE shall finish the transmission of all repetitions of the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tinterrupt = 35 ms in the test; Tinterrupt is defined in clause 5.5A.2.1.2.

This gives a total of 50 ms.

#### A.14.2.1.2 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition

##### A.14.2.1.2.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency handover requirements without SFN acquisition for Satellite Access specified in clause 5.5A.2.2.

The test configurations are given in Table A.14.2.1.1.2-1. The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.14.2.1.1.2-2 and A.14.2.1.1.2-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2.

E-UTRAN shall send a RRC message implying handover to Cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. The field sameSFN-Indication and mib-RepetitionStatus are included in the handover command. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search, because the narrowband of the PDSCH Reference Measurement Channel does not overlap with the centre 6 PRBs of the carrier bandwidth.

Table A.14.2.1.1.2-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

Table A. 14.2.1.1.2-2: General test parameters for E-UTRAN HD-FDD intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 |  |
| Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| Satellite information | Config 1 |  | SSC.1 for Cell1  NSC.1 for Cell2 | GSO |
| Config 2 |  | SSC.2 for Cell1  NSC.2 for Cell2 | NGSO |
| E-UTRA RF Channel Number | |  | 1 | Only one FDD carrier frequency is used. |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.1.1-3: Cell specific test parameters for E-UTRAN HD-FDD intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | | | | | |
| **T1** | **T2** | **T3** | **T1** | | **T2** | | | **T3** | |
| E-UTRA RF Channel Number |  | 1 | | | | | | | | | |
| BWchannel | MHz | 1.4 | | | | | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.2 |  | R.49 HD-FDD | R.49 HD-FDD | - | - | - | | | R.49 HD-FDD | | |
| MPDCCH Reference Channel in clause A.3.1.3.2 |  | R.47 HD-FDD | | | R.47 HD-FDD | | | | | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.21 FDD | OP.21 FDD | OP.6 FDD | OP.6 FDD | OP.6 FDD | | | OP.21 FDD | | |
| PBCH\_RA | dB | -3 | | | -3 | | | | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Note 2 | dBm/15 KHz | -98 | | | | | | | | | |
| Note 3 | dB | 8 | 8 | 8 | -Infinity | | 12 | | | 12 | |
|  | dB | 8 | -4.27 | -4.27 | -Infinity | | | 3.36 | | | 3.36 |
| RSRP Note 3 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | | -86 | | | -86 | |
| Propagation Condition |  | AWGN | | | AWGN | | | | | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | | | | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | 3 | | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves | | | | | | | | | | | |

##### A.14.2.1.2.2 Test Requirements

The UE shall finish the transmission of all the repetitions of the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tinterrupt = 35 ms in the test; Tinterrupt is defined in clause 5.5A.2.1.2.

This gives a total of 50 ms.

#### A.14.2.1.3 E-UTRAN FDD-FDD Intra frequency conditional handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.3.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency conditional handover requirements with SFN acquisition for Satellite Access as specified in clause 5.5.2.1.

The test configurations are given in Table A.14.2.1.3.1-1. The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.14.2.1.3.1-2 and A.14.2.1.3.1-3. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2.

E-UTRAN shall send a RRC message implying conditional handover to Cell 2. The RRC message implying conditional handover shall be sent to the UE during period T1, at a time earlier than TRRC before the beginning of T2. The field sameSFN-Indication and mib-RepetitionStatus are not included in the handover command. At the start of T2, cell 2 becomes detectable and meets the handover condition.

During the test, UE is configured with measurement gap for cell search, because the narrowband of the PDSCH Reference Measurement Channel does not overlap with the centre 6 PRBs of the carrier bandwidth.

Table A.14.2.1.3.1-2: General test parameters for E-UTRAN FDD-FDD intra frequency conditional handover for Cat-M1 UEs in CEModeA test case

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 |  |
| Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| Satellite information | Config 1 |  | SSC.1 for Cell1  NSC.1 for Cell2 | GSO |
| Config 2 |  | SSC.2 for Cell1  NSC.2 for Cell2 | NGSO |
| E-UTRA RF Channel Number | |  | 1 | Only one FDD carrier frequency is used. |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| Time offset between cells | |  | 3ms | Asynchronous cells |
| T1 | | s | 5 |  |
| T2 | | s | ≤2 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.3.1-3: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency conditional handover for Cat-M1 UEs in CEModeA test case

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| E-UTRA RF Channel Number |  | 1 | | 1 | |
| BWchannel | MHz | 1.4 | | 1.4 | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.48 FDD | - | - | R.48 FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.46 FDD | | R.46 FDD | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD) |  | OP.21 FDD | OP.6 FDD | OP.6 FDD | OP.21 FDD |
| PBCH\_RA | dB | -3 | | -3 | |
| 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 |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
|  | dB | 8 | -4.27 | -Infinity | 3.36 |
| Note 2 | dBm/15 KHz | -98 | | | |
|  | dB | 8 | 8 | - Infinity | 12 |
| RSRP Note 3 | dBm/15 KHz | -90 | -90 | - Infinity | -86 |
| Propagation Condition |  | AWGN | | | |
| Antenna Configuration |  | 1x1 | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | |

##### A.14.2.1.3.2 Test Requirements

TRRC + TEvent\_DU occurs during T1 as the handover condition becomes satisfied at the start of T2. The test shall verify that there are no interruptions during T1.

The UE shall start to transmit the PRACH to Cell 2 less than Tmeasure + Tinterrupt + TCHO\_execution = 965 ms from the start of T2 and interruption during T2 shall not exceed 155ms.

The rate of correct conditional handovers observed during repeated tests shall be at least 90%.

NOTE: The conditional handover delay can be expressed as: TRRC + TDelayUncertainty + Tmeasure + TCHO\_execution + Tinterrupt, where:

TRRC = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tmeasure = 800 ms in the test; Tmeasure is defined in clause 5.5A.2.3.2 without TDelayUncertainty.

TCHO\_execution = 10 ms in the test; TCHO\_execution is defined in clause 5.5A.2.3.3.

Tinterrupt = 155 ms in the test; Tinterrupt is defined in clause 5.5A.2.3.4.

#### A.14.2.1.4 E-UTRAN HD-FDD Intra frequency conditional handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.4.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency conditional handover requirements with SFN acquisition for Satellite Access as specified in clause 5.5.2.2.

The test configurations are given in Table A.14.2.1.4.1-1. The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.14.2.1.4.1-2 and A.14.2.1.4.1-3. The The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2.

E-UTRAN shall send a RRC message implying conditional handover to Cell 2. The RRC message implying conditional handover shall be sent to the UE during period T1, at a time earlier than TRRC before the beginning of T2. The field sameSFN-Indication and mib-RepetitionStatus are not included in the handover command. At the start of T2, cell 2 becomes detectable and meets the handover condition.

During the test, UE is configured with measurement gap for cell search, because the narrowband of the PDSCH Reference Measurement Channel does not overlap with the centre 6 PRBs of the carrier bandwidth.

Table A.14.2.1.4.1-2: General test parameters for E-UTRAN HD-FDD intra frequency conditional handover for Cat-M1 UEs in CEModeA test case

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 |  |
| Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| Satellite information | Config 1 |  | SSC.1 for Cell1  NSC.1 for Cell2 | GSO |
| Config 2 |  | SSC.2 for Cell1  NSC.2 for Cell2 | NGSO |
| E-UTRA RF Channel Number | |  | 1 | Only one FDD carrier frequency is used. |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| Time offset between cells | |  | 3ms | Asynchronous cells |
| T1 | | s | 5 |  |
| T2 | | s | ≤2 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.4.1-3: Cell specific test parameters for E-UTRAN HD-FDD intra frequency handover for Cat-M1 UEs in CEModeA test case

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| E-UTRA RF Channel Number |  | 1 | | 1 | |
| BWchannel | MHz | 1.4 | | 1.4 | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.49 HD-FDD | - | - | R.49 HD-FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.47 HD-FDD | | R.47 HD-FDD | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD) |  | OP.21 FDD | OP.6 FDD | OP.6 FDD | OP.21 FDD |
| PBCH\_RA | dB | -3 | | -3 | |
| 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 |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
|  | dB | 8 | -4.27 | -Infinity | 3.36 |
| Note 2 | dBm/15 KHz | -98 | | | |
|  | dB | 8 | 8 | - Infinity | 12 |
| RSRP Note 3 | dBm/15 KHz | -90 | -90 | - Infinity | -86 |
| Propagation Condition |  | AWGN | | | |
| Antenna Configuration |  | 1x1 | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | |

##### A.14.2.1.4.2 Test Requirements

TRRC + TEvent\_DU occurs during T1 as the handover condition becomes satisfied at the start of T2. The test shall verify that there are no interruptions during T1.

The UE shall start to transmit the PRACH to Cell 2 less than Tmeasure + Tinterrupt + TCHO\_execution = 965 ms from the start of T2 and interruption during T2 shall not exceed 155ms.

The rate of correct conditional handovers observed during repeated tests shall be at least 90%.

NOTE: The conditional handover delay can be expressed as: TRRC + TDelayUncertainty + Tmeasure + TCHO\_execution + Tinterrupt, where:

TRRC = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tmeasure = 800 ms in the test; Tmeasure is defined in clause 5.5A.2.3.2 without TDelayUncertainty.

TCHO\_execution = 10 ms in the test; TCHO\_execution is defined in clause 5.5A.2.3.3.

Tinterrupt = 155 ms in the test; Tinterrupt is defined in clause 5.5A.2.3.4.

## <<< NEXT CHANGE >>>

#### A.14.2.1.5 E-UTRAN FDD Intra frequency handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.5.1 Test Purpose and Environment

This test is to verify the requirement for the FDD intra frequency handover requirements.

The test configurations are given in Table A.14.2.1.5.1-1. The test scenario comprises one E-UTRA FDD carrier and two cells as given in tables A.14.2.1.5.1-2 and A.14.2.1.5.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2 during period T2, after the UE has reported Event A3. The *field sameSFN-Indication* is not included in the handover command. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search.

Table A.14.2.1.5.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.5.1-2: General test parameters for E-UTRAN FDD intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.5.1-3: Cell specific test parameters for E-UTRAN FDD intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.48 FDD | R.48 FDD | - | - | - | R.48 FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.46 FDD | | | R.46 FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | 8 | 8 | -Infinity | 12 | 12 |
| Note 4 | dB | 8 | -4.27 | -4.27 | -Infinity | 3.36 | 3.36 |
| RSRP Note 4 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | -86 | -86 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.5.2 Test Requirements

The UE shall finish the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tinterrupt = 120+35 ms in the test; Tinterrupt is defined in clause 5.5A.2.1.2.

This gives a total of 170 ms.

#### 14.2.1.6 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.6.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency handover requirements.

The test configurations are given in Table A.14.2.1.6.1-1. The test scenario comprises one E-UTRA FDD carrier and two cells as given in tables A.14.2.1.6.1-2 and A.14.2.1.6.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2 during period T2, after the UE has reported Event A3. The *field sameSFN-Indication* is not included in the handover command. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search.

Table A.14.2.1.6.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.6.1-2: General test parameters for E-UTRAN HD-FDD intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.6.1-3: Cell specific test parameters for E-UTRAN HD-FDD intra frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.49 HD-FDD | R.49 HD-FDD | - | - | - | R.49 HD-FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.47 HD-FDD | | | R.47 HD-FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | 8 | 8 | -Infinity | 12 | 12 |
| Note 4 | dB | 8 | -4.27 | -4.27 | -Infinity | 3.36 | 3.36 |
| RSRP Note 4 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | -86 | -86 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.6.2 Test Requirements

The UE shall finish the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tinterrupt = 120+35 ms in the test; Tinterrupt is defined in clause 5.5A.2.1.2.

This gives a total of 170 ms.

#### A.14.2.1.7 E-UTRAN FD-FDD Inter frequency handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.7.1 Test Purpose and Environment

This test is to verify the requirement for the FDD inter frequency handover requirements.

The test configurations are given in Table A.14.2.1.7.1-1. The test scenario comprises of two E-UTRA FDD carrier and one cell in each carrier as given in tables A.14.2.1.7.1-2 and A.14.2.1.7.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2 during period T2, after the UE has reported Event A3. . The *field sameSFN-Indication* is not included in the handover command. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap to enable inter-frequency measurement.

Table A.14.2.1.7.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.7.1-2: General test parameters for E-UTRAN FDD inter frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.7.1-3: Cell specific test parameters for E-UTRAN FDD inter frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.3 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.4 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.48 FDD | R.48 FDD | - | - | - | R.48 FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.46 FDD | | | R.46 FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | 8 | 8 | -Infinity | 12 | 12 |
| Note 4 | dB | 8 | -4.27 | -4.27 | -Infinity | 3.36 | 3.36 |
| RSRP Note 4 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | -86 | -86 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.7.2 Test Requirements

The UE shall finish the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tinterrupt = 120+35 ms in the test; Tinterrupt is defined in clause 5.5A.2.1.2.

This gives a total of 170 ms.

#### A.14.2.1.8 E-UTRAN HD-FDD Inter frequency handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.8.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD inter frequency handover requirements. The test configurations are given in Table A.14.2.1.8.1-1.

The test scenario comprises of two E-UTRA FDD carrier and one cell in each carrier as given in tables A.14.2.1.8.1-2 and A.14.2.1.8.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2 during period T2, after the UE has reported Event A3. The *field sameSFN-Indication* is not included in the handover command. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap to enable inter-frequency measurement.

Table A.14.2.1.8.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.8.1-2: General test parameters for E-UTRAN HD-FDD inter frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.8.1-3: Cell specific test parameters for E-UTRAN HD-FDD inter frequency handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.3 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.4 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.49 HD-FDD | R.49 HD-FDD | - | - | - | R.49 HD-FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.47 HD-FDD | | | R.47 HD-FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | 8 | 8 | -Infinity | 12 | 12 |
| Note 4 | dB | 8 | -4.27 | -4.27 | -Infinity | 3.36 | 3.36 |
| RSRP Note 4 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | -86 | -86 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.8.2 Test Requirements

The UE shall finish the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tinterrupt = 120+35 ms in the test; Tinterrupt is defined in clause 5.5A.2.1.2.

This gives a total of 170 ms.

#### A.14.2.1.9 E-UTRAN FDD Inter frequency handover for Cat-M1 UEs in CEModeB

##### A.14.2.1.9.1 Test Purpose and Environment

This test is to verify the requirement for the FDD inter frequency handover requirements.

The test configurations are given in Table A.14.2.1.9.1-1. The test scenario comprises of two E-UTRA FDD carrier and one cell in each carrier as given in tables A.14.2.1.9.1-2 and A.14.2.1.9.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2 during period T2, after the UE has reported Event A3. . The *field sameSFN-Indication* is not included in the handover command. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap to enable inter-frequency measurement.

Table A.14.2.1.9.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.9.1-2: General test parameters for E-UTRAN FDD inter frequency handover for Cat-M1 UEs in CEModeB without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.9.1-3: Cell specific test parameters for E-UTRAN FDD inter frequency handover for Cat-M1 UEs in CEModeB without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.52 FDD | R.52 FDD | - | - | - | R.52 FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.50 FDD | | | R.50 FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7FDD | OP.7 FDD | OP7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | -12 | -12 | -12 | -Infinity | -4 | -4 |
| Note 4 | dB | -12 | -12 | -12 | -Infinity | -4 | -4 |
| RSRP Note 4 | dBm/15 KHz | -110 | -110 | -110 | -Infinity | -102 | -102 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.9.2 Test Requirements

The UE shall finish the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tinterrupt = 2560+35 ms in the test; Tinterrupt is defined in clause 5.5A.2.1.2.

This gives a total of 2610 ms.

#### A.14.2.1.10 E-UTRAN HD-FDD Inter frequency handover for Cat-M1 UEs in CEModeB

##### A.14.2.1.10.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD inter frequency handover requirements. The test configurations are given in Table A.14.2.1.10.1-1.

The test scenario comprises of two E-UTRA FDD carrier and one cell in each carrier as given in tables A.14.2.1.10.1-2 and A.14.2.1.10.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2 during period T2, after the UE has reported Event A3. The *field sameSFN-Indication* is not included in the handover command. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap to enable inter-frequency measurement.

Table A.14.2.1.10.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.10.1-2: General test parameters for E-UTRAN HD-FDD inter frequency handover for Cat-M1 UEs in CEModeB without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.10.1-3: Cell specific test parameters for E-UTRAN HD-FDD inter frequency handover for Cat-M1 UEs in CEModeB without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.53 HD-FDD | R.53  HD-FDD | - | - | - | R.53 HD-FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.51 HD-FDD | | | R.51 HD-FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | -12 | -12 | -12 | -Infinity | -4 | -4 |
| Note 4 | dB | -12 | -12 | -12 | -Infinity | -4 | -4 |
| RSRP Note 4 | dBm/15 KHz | -110 | -110 | -110 | -Infinity | -102 | -102 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.10.2 Test Requirements

The UE shall finish the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + Tinterrupt, where:

RRC procedure delay = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tinterrupt = 2560+35 ms in the test; Tinterrupt is defined in clause 5.5A.2.1.2.

This gives a total of 2610 ms.

#### A.14.2.1.11 E-UTRAN FDD-FDD Inter frequency conditional handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.11.1 Test Purpose and Environment

This test is to verify the requirement for the FDD inter frequency conditional handover requirements.

The test configurations are given in Table A.14.2.1.11.1-1. The test scenario comprises of two E-UTRA FDD carrier and one cell in each carrier as given in tables A.14.2.1.11.1-2 and A.14.2.1.11.1-3 The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

E-UTRAN shall send a RRC message implying conditional handover to Cell 2 during period T1 at a time earlier than TRRC before the beginning of T2. The *field sameSFN-Indication* is not included in the handover command. At the start of T2, cell 2 becomes detectable and meets the handover condition.

During the test, UE is configured with measurement gap to enable inter-frequency measurement.

Table A.14.2.1.11.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.11.1-2: General test parameters for E-UTRAN FDD Inter frequency conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤2 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.11.1-3: Cell specific test parameters for E-UTRAN FDD Inter frequency conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | | **T1** | **T3** | |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.48 FDD | R.48 FDD | | - | R.48 FDD | |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.46 FDD | | | R.46 FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | | OP.7 FDD | OP.7 FDD | | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | | -3.33 | -Infinity | | 2.36 |
| Note 4 | dB | 8 | | 8 | -Infinity | | 11 |
| RSRP Note 4 | dBm/15 KHz | -90 | | -90 | -Infinity | | -87 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.12.2 Test Requirements

TRRC + TEvent\_DU occurs during T1 as the handover condition becomes satisfied at the start of T2. The test shall verify that there are no interruptions during T1.

The UE shall start to transmit the PRACH to Cell 2 less than Tmeasure + Tinterrupt + TCHO\_execution = [860 ms] from the start of T2 and interruption during T2 shall not exceed 50ms.

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

NOTE: The conditional handover delay can be expressed as: TRRC + TDelayUncertainty + Tmeasure + TCHO\_execution + Tinterrupt, where:

TRRC = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tmeasure = [800] ms in the test; Tmeasure is defined in clause 5.5A.2.3.2 without TDelayUncertainty.

TCHO\_execution = 10 ms in the test; TCHO\_execution is defined in clause 5.5A.2.3.3.

#### A.14.2.1.12 E-UTRAN HD-FDD Inter frequency conditional handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.12.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD inter frequency conditional handover requirements. The test configurations are given in Table A.14.2.1.12.1-1.

The test scenario comprises of two E-UTRA FDD carrier and one cell in each carrier as given in tables A.14.2.1.12.1-2 and A.14.2.1.12.1-3. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

E-UTRAN shall send a RRC message implying conditional handover to Cell 2 during period T1 at a time earlier than TRRC before the beginning of T2. The *field sameSFN-Indication* is not included in the handover command. At the start of T2, cell 2 becomes detectable and meets the handover condition.

During the test, UE is configured with measurement gap to enable inter-frequency measurement.

Table A.14.2.1.12.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.12.1-2: General test parameters for E-UTRAN HD-FDD Inter frequency conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 1 |  |

Table A.14.2.1.12.1-3: Cell specific test parameters for E-UTRAN HD-FDD Inter frequency conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.49 HD-FDD | R.49 HD-FDD | - | - | - | R.49 HD-FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.47 HD-FDD | | | R.47 HD-FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | 8 | 8 | -Infinity | 12 | 12 |
| Note 4 | dB | 8 | -4.27 | -4.27 | -Infinity | 3.36 | 3.36 |
| RSRP Note 4 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | -86 | -86 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.12.2 Test Requirements

TRRC + TEvent\_DU occurs during T1 as the handover condition becomes satisfied at the start of T2. The test shall verify that there are no interruptions during T1.

The UE shall start to transmit the PRACH to Cell 2 less than Tmeasure + Tinterrupt + TCHO\_execution = [860 ms] from the start of T2 and interruption during T2 shall not exceed 50ms.

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

NOTE: The conditional handover delay can be expressed as: TRRC + TDelayUncertainty + Tmeasure + TCHO\_execution + Tinterrupt, where:

TRRC = 15 ms and is specified in clause 11.2 in TS 36.331 [2].

Tmeasure = [800] ms in the test; Tmeasure is defined in clause 5.5A.2.3.2 without TDelayUncertainty.

TCHO\_execution = 10 ms in the test; TCHO\_execution is defined in clause 5.5A.2.3.3.

Tinterrupt = 50 ms in the test; Tinterrupt is defined in clause 5.1.2.6.4.

5.5A.2.3A.14.2.1.13 E-UTRAN FDD Intra frequency time based condition handover for Cat-M1 UEs in CEModeA

A.14.2.1.13.1 Test Purpose and Environment

This test is to verify the requirement for the FDD intra frequency handover requirements.

The test configurations are given in Table A.14.2.1.13.1-1. The test scenario comprises one E-UTRA FDD carrier and two cells as given in tables A.14.2.1.13.1-2 and A.14.2.1.13.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

During T1, the UE is configured to measure intra-frequency neighbour cell. The RRC message implying time-based handover to cell 2 with Event CondEvent T1 and CondEvent A3 shall be sent to UE, at a time earlier than TRRC (15ms) before the beginning of T2. Starting T2, cell 2 becomes detectable and offset better than cell 1. Time period T3 starts at 1500ms after beginning of T2, and time condition event t1-Threshold-r17 is fulfilled at beginning of T3.

During the test, UE is configured with measurement gap for cell search.

**Table A.14.2.1.13.1-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.13.1-2: General test parameters for E-UTRAN FDD intra frequency time based conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 1 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | 1.5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 0 |  |

**Table A.14.2.1.13.1-3: Cell specific test parameters for E-UTRAN FDD intra frequency time based conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.48 FDD | R.48 FDD | - | - | - | R.48 FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.46 FDD | | | R.46 FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | 8 | 8 | -Infinity | 12 | 12 |
| Note 4 | dB | 8 | -4.27 | -4.27 | -Infinity | 3.36 | 3.36 |
| RSRP Note 4 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | -86 | -86 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

A.14.2.1.13.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 later than beginning of T3 and less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay is defined in clause 5.5A.2.3, can be expressed as:

DCHO = TRRC + TEvent\_DU + Tmeasure + Tinterrupt + TCHO\_execution

where:

TRRC = 15, which is the RRC procedure delay as specified in clause 11.2 in TS 36.331 [2] and included in T1.

TEvent\_DU = 0, with CondEvent A3 met at beginning of T2;

Tmeasure = max(1440, 1500) ms, where 1440ms is the cell identification time, and Tmeasure is included in T2;

Tinterrupt = 40ms with Tsearch = 0;

TCHO\_execution = 10ms.

This gives a total of 50 ms from beginning of T3.

14.2.1.14 E-UTRAN HD-FDD Intra frequency location based condition handover for Cat-M1 UEs in CEModeA

A.14.2.1.14.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD intra frequency handover requirements.

The test configurations are given in Table A.14.2.1.14.1-1. The test scenario comprises one E-UTRA FDD carrier and two cells as given in tables A.14.2.1.14.1-2 and A.14.2.1.14.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

During T1, the UE is configured to measure intra-frequency neighbour cell. The RRC message implying location-based handover to cell 2 with Event CondEvent D1 and CondEvent A3 shall be sent to UE, at a time earlier than TRRC (15ms) before the beginning of T2. Starting T2, cell 2 becomes detectable and offset better than cell 1. Time period T3 starts at 1500ms after beginning of T2, and location condition condEventD1-r17 is fulfilled at beginning of T3.

During the test, UE is configured with measurement gap for cell search.

**Table A.14.2.1.14.1-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.14.1-2: General test parameters for E-UTRAN HD-FDD intra frequency location based conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| A3-Offset | | dB | 0 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | 1.5 |  |
| T3 | | s | 1 |  |
| Gap pattern ID | |  | 0 |  |
| UE position (N,S, H) at T2 start | |  | [(0, 0, 0)] | Set by AT command |
| UE moving speed | | km/h | [(108, 0, 0)] | Set by AT command |
| referenceLocation1-r17.condEventD1-r17 | | m | [(-700, 0, 0)] | Reference location for serving cell |
| referenceLocation2-r17.condEventD1-r17 | | m | [(1300, 0, 0)] | Reference location for target cell |

**Table A.14.2.1.14.1-3: Cell specific test parameters for E-UTRAN HD-FDD intra frequency location based conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.49 HD-FDD | R.49 HD-FDD | - | - | - | R.49 HD-FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.47 HD-FDD | | | R.47 HD-FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | 8 | 8 | -Infinity | 12 | 12 |
| Note 4 | dB | 8 | -4.27 | -4.27 | -Infinity | 3.36 | 3.36 |
| RSRP Note 4 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | -86 | -86 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

A.14.2.1.14.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 later than beginning of T3 and less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay is defined in clause 5.5A.2.3, can be expressed as:

DCHO = TRRC + TEvent\_DU + Tmeasure + Tinterrupt + TCHO\_execution

where:

TRRC = 15, which is the RRC procedure delay as specified in clause 11.2 in TS 36.331 [2] and included in T1.

TEvent\_DU = 0, with CondEvent A3 met at beginning of T2;

Tmeasure = max(1440, 1500) ms, where 1440ms is the cell identification time, and Tmeasure is included in T2;

Tinterrupt = 40ms with Tsearch = 0;

TCHO\_execution = 10ms.

This gives a total of 50 ms from beginning of T3.

#### A.14.2.1.15 E-UTRAN FDD-FDD Inter frequency location based conditional handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.15.1 Test Purpose and Environment

This test is to verify the requirement for the FDD inter frequency conditional handover requirements.

The test configurations are given in Table A.14.2.1.15.1-1. The test scenario comprises of two E-UTRA FDD carrier and one cell in each carrier as given in tables A.14.2.1.15.1-2 and A.14.2.1.15.1-3. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

During T1, the UE is configured to measure intra-frequency neighbour cell. The RRC message implying location-based handover to cell 2 with Event CondEvent D1 and without CondEvent A3 shall be sent to UE, at a time earlier than TRRC (15ms) before the beginning of T2. Starting T2, cell 2 becomes detectable and offset better than cell 1 and location condition event condEventD1-r17 is fulfilled.

During the test, UE is configured with measurement gap for cell search.

Table A.14.2.1.15.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.15.1-2: General test parameters for E-UTRAN FDD Inter frequency conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤2 |  |
| Gap pattern ID | |  | 0 |  |

Table A.14.2.1.15.1-3: Cell specific test parameters for E-UTRAN FDD Inter frequency conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | | **T1** | **T3** | |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.48 FDD | R.48 FDD | | - | R.48 FDD | |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.46 FDD | | | R.46 FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | | OP.7 FDD | OP.7 FDD | | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | | -3.33 | -Infinity | | 2.36 |
| Note 4 | dB | 8 | | 8 | -Infinity | | 11 |
| RSRP Note 4 | dBm/15 KHz | -90 | | -90 | -Infinity | | -87 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.16.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 no later than 1490 ms from the beginning of time period T2.

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

NOTE: The handover delay is defined in clause 5.5A.2.3, can be expressed as:

DCHO = TRRC + TEvent\_DU + Tinterrupt + TCHO\_execution

where:

TRRC = 15, which is the RRC procedure delay as specified in clause 11.2 in TS 36.331 [2] and included in T1

TEvent\_DU = 0, with condEventD1-r17 met at beginning of T2;

Tinterrupt = 1480ms with Tsearch = 1440ms;

TCHO\_execution = 10ms.

This gives a total of 1490 ms from beginning of T3.

#### A.14.2.1.16 E-UTRAN HD-FDD Inter frequency time based conditional handover for Cat-M1 UEs in CEModeA

##### A.14.2.1.16.1 Test Purpose and Environment

This test is to verify the requirement for the HD-FDD inter frequency conditional handover requirements. The test configurations are given in Table A.14.2.1.16.1-1.

The test scenario comprises of two E-UTRA FDD carrier and one cell in each carrier as given in tables A.14.2.1.16.1-2 and A.14.2.1.16.1-3. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE shall have had the opportunity to acquire satellite assistance information for Cell 2, provided by Cell 1 in *SystemInformationBlockType33.*

During T1, the UE is configured to measure intra-frequency neighbour cell. The RRC message implying location-based handover to cell 2 with Event CondEvent T1 and without CondEvent A3 shall be sent to UE, at a time earlier than TRRC (15ms) before the beginning of T2. Starting T2, cell 2 becomes detectable and offset better than cell 1 and location condition event t1-Threshold-r17 is fulfilled.

During the test, UE is configured with measurement gap for cell search.

Table A.14.2.1.16.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

**Table A.14.2.1.16.1-2: General test parameters for E-UTRAN HD-FDD Inter frequency time based conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbouring cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| Final condition | Active cell |  | Cell 2 |  |
| Hysteresis | | dB | 0 |  |
| Time To Trigger | | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| DRX | |  |  | OFF |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration | |  | PRACH\_4CE | As specified in A.3.16 |
| PRACH initial CE level | |  | 0 | Specified in the handover message |
| T1 | | s | 5 |  |
| T2 | | s | ≤2 |  |
| Gap pattern ID | |  | 0 |  |

Table A.14.2.1.16.1-3: Cell specific test parameters for E-UTRAN HD-FDD Inter frequency time based conditional handover for Cat-M1 UEs in CEModeA without SFN acquisition test case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | |
| Satellite Information (Configuration 1)Note 1 |  | SSC.1 | | | NSC.1 | | |
| Satellite Information (Configuration 2)Note 1 |  | SSC.2 | | | NSC.2 | | |
| BWchannel | MHz | 1.4 | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.49 HD-FDD | R.49 HD-FDD | - | - | - | R.49 HD-FDD |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.47 HD-FDD | | | R.47 HD-FDD | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | dB | -3 | | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| PDCCH\_RA | dB |
| PDCCH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 2 | dB |
| OCNG\_RBNote 2 | dB |
| Note 3 | dBm/15 KHz | -98 | | | | | |
|  | dB | 8 | 8 | 8 | -Infinity | 12 | 12 |
| Note 4 | dB | 8 | -4.27 | -4.27 | -Infinity | 3.36 | 3.36 |
| RSRP Note 4 | dBm/15 KHz | -90 | -90 | -90 | -Infinity | -86 | -86 |
| Propagation Condition |  | AWGN | | | AWGN | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | |
| Timing offset to Cell 1  Synchronous cells | us | - | | | Based on Satellite Assistance information | | |
| Note 1: Satellite information is determined according to the testing principles for NTN determined in clause B.3.8. If satellite movement is applicable, it should be considered for the duration of the test case.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP level has been derived from other parameters for information purpose. They are not settable parameters themselves. | | | | | | | |

##### A.14.2.1.16.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 no later than 1490 ms from the beginning of time period T2.

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

NOTE: The handover delay is defined in clause 5.5A.2.3, can be expressed as:

DCHO = TRRC + TEvent\_DU + Tinterrupt + TCHO\_execution

where:

TRRC = 15, which is the RRC procedure delay as specified in clause 11.2 in TS 36.331 [2] and included in T1

TEvent\_DU = 0, with CondEvent T1 met at beginning of T2;

Tinterrupt = 1480ms with Tsearch = 1440ms;

TCHO\_execution = 10ms.

This gives a total of 1490 ms from beginning of T3.

## <<< NEXT CHANGE >>>

## A.14.3 RRC connection mobility control for satellite access

### A.14.3.1 RRC re-establishment for satellite access

#### A.14.3.1.1 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA for Satellite access

##### A.14.3.1.1.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA FDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.7A.2.

The UE shall be provided with the valid information about the SAN serving cells before the test.

Table A.14.3.1.1.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

The test parameters are given in table A.14.3.1.1.1-2 and table A.14.3.1.1.1-3 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table A.14.3.1.1.1-2: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 |  |
| Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| E-UTRA RF Channel Number | |  | 1 | Only one FDD carrier frequency is used. |
| Channel Bandwidth (BWchannel) | | MHz | 10 |  |
| PRACH Configuration | |  | PRACH\_2CE | As specified in A.3.16 |
| N310 | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | ms | 0 | Radio link failure timer; T310 is disabled |
| T311 | | ms | 3000 | RRC re-establishment timer |
| DRX | |  | OFF |  |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration index | |  | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| Time offset between cells | | ms | 3 | Asynchronous cells |
| T1 | | s | 5 |  |
| T2 | | ms | 400 |  |
| T3 | | s | 3 |  |

Table A.14.3.1.1.1-3: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | | | | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | | | **T3** | | |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | | | | | |
| BWchannel | MHz | 10 | | | 10 | | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.1 |  | R.21 FDD | R.21 FDD | - | - | | - | | | R.21 FDD | |
| MPDCCH Reference Channel in clause A.3.1.3.1 |  | R.17 FDD | | | R.17 FDD | | | | | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.21 FDD | OP.21 FDD | OP.6 FDD | OP.6 FDD | | OP.6 FDD | | | OP.21 FDD | |
| PBCH\_RA | dB | -3 | | | -3 | | | | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
|  | dB | 1.54 | -Infinity | -Infinity | -3.79 | | | 4 | | | 4 |
| Note 2 | dBm/15 KHz | -98 | | | | | | | | | |
|  | dB | 7 | -Infinity | -Infinity | 4 | | | 4 | | | 4 |
| RSRP Note 3 | dBm/15 KHz | -91 | -Infinity | -Infinity | -94 | | | -94 | | | -94 |
| Propagation Condition |  | AWGN | | | AWGN | | | | | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | | | |

##### A.14.3.1.1.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE\_re-establish\_delay.

Where:

TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

TUE\_re-establish\_delay = 50 ms + Nfreq\* Tsearch + TSI-EUTRA-M1-CEModeA + TPRACH

Nfreq = 1

Ksatellite,i=1

Tsearch = 0 ms

TSI-EUTRA-M1-CEModeA = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN FDD cell.

TPRACH = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1345 ms, allow 1.5 s in the test case.

#### A.14.3.1.2 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA

##### A.14.3.1.2.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA FDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.7A.2.

The UE shall be provided with the valid information about the SAN serving cells before the test.

Table A.14.6.2.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GEO/GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. GEO configuration only applies for Rel-17 UEs. GSO configuration is applicable for Rel-18 and onward UEs, when SIB33 is provided to the UE.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

The test parameters are given in table A.14.3.1.2.1-2 and table A.14.3.1.2.1-3 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table A.14.3.1.2.1-2: General test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment test case

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 |  |
| Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| E-UTRA RF Channel Number | |  | 1 | Only one FDD carrier frequency is used. |
| Channel Bandwidth (BWchannel) | | MHz | 10 |  |
| PRACH Configuration | |  | PRACH\_2CE | As specified in A.3.16 |
| N310 | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | ms | 0 | Radio link failure timer; T310 is disabled |
| T311 | | ms | 3000 | RRC re-establishment timer |
| DRX | |  | OFF |  |
| CP length | |  | Normal |  |
| Access Barring Information | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration index | |  | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| Time offset between cells | | ms | 3 | Asynchronous cells |
| T1 | | s | 5 |  |
| T2 | | ms | 400 |  |
| T3 | | s | 3 |  |

Table A.14.3.1.2.1-3: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment test case

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | | | | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | | | **T3** | | |
| E-UTRA RF Channel Number |  | 1 | | | 1 | | | | | | |
| BWchannel | MHz | 10 | | | 10 | | | | | | |
| PDSCH Reference Channel in clause A.3.1.4.2 |  | R.11 HD-FDD | R.11 HD-FDD | - | - | | - | | | R.11 HD-FDD | |
| MPDCCH Reference Channel in clause A.3.1.3.2 |  | R.7 HD-FDD | | | R.7 HD-FDD | | | | | | |
| OCNG Patterns in clause A.3.2.1 |  | OP.21 FDD | OP.21 FDD | OP.6 FDD | OP.6 FDD | | OP.6 FDD | | | OP.21 FDD | |
| PBCH\_RA | dB | -3 | | | -3 | | | | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
|  | dB | 1.54 | -Infinity | -Infinity | -3.79 | | | 4 | | | 4 |
| Note 2 | dBm/15 KHz | -98 | | | | | | | | | |
|  | dB | 7 | -Infinity | -Infinity | 4 | | | 4 | | | 4 |
| RSRP Note 3 | dBm/15 KHz | -91 | -Infinity | -Infinity | -94 | | | -94 | | | -94 |
| Propagation Condition |  | AWGN | | | AWGN | | | | | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | | | |

##### A.14.3.1.2.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE\_re-establish\_delay.

Where:

TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

TUE\_re-establish\_delay = 50 ms + Nfreq\* Tsearch + TSI-EUTRA-M1-CEModeA + TPRACH

Nfreq = 1

Ksatellite,i=1

Tsearch = 0 ms

TSI-EUTRA-M1-CEModeA = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN FDD cell.

TPRACH = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1345 ms, allow 1.5 s in the test case.

## <<< NEXT CHANGE >>>

#### A.14.3.1.3 E-UTRAN FD-FDD Inter-frequency RRC Re-establishment for Cat-M1 UE in CEModeA for Satellite access

##### A.14.3.1.3.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA FDD inter-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.7A.2.

The UE shall be provided with the valid information about the SAN serving cells before the test.

The test parameters are given in table A.14.3.1.3-1 and table A.14.3.1.3-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the UE shall be indicated with the carrier frequency of Cell 2 to ensure that the UE has the context of the carrier frequency of Cell 2. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of radio link failure. At the start of time period T3, cell 2, which is the neighbour cell, is activated.

Table A.14.3.1.3.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

Table A.14.3.1.3.1-2: General test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | | | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell | |  | Cell 1 |  |
| Neighbouring cell | |  | Cell 2 |  |
| Final condition | Active cell | |  | Cell 2 |  |
| E-UTRA RF Channel Number (cell 1) | | |  | 1 | Only one FDD carrier frequency is used. |
| E-UTRA RF Channel Number (cell 2) | | |  | 2 |  |
| E-UTRA FDD inter-frequency carrier list size | | |  | 1 | 2 E-UTRA FDD carrier frequencies in total: 1 intra-frequency and 1 inter-frequency |
| Satellite information | | Config 1 |  | SSC.1 | GSO |
| Config 2 | SSC.2 | NGSO |
| Channel Bandwidth (BWchannel) | | | MHz | 10 |  |
| PRACH Configuration | | |  | PRACH\_2CE | As specified in A.3.16 |
| N310 | | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | | ms | 0 | Radio link failure timer; T310 is disabled |
| T311 | | | ms | 3000 | RRC re-establishment timer |
| DRX | | |  | OFF |  |
| CP length | | |  | Normal |  |
| Access Barring Information | | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration index | | |  | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| Time offset between cells | | | ms | 3 | Asynchronous cells |
| T1 | | | s | 5 |  |
| T2 | | | ms | 400 |  |
| T3 | | | s | 3 |  |

Table A.14.3.1.3.1-3: Cell specific test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Cell 1 | | | Cell 2 | | | | | | |
| T1 | T2 | T3 | T1 | T2 | | | T3 | | |
| E-UTRA RF Channel Number |  | 1 | | | 2 | | | | | | |
| BWchannel | MHz | 1.4 | | | 1.4 | | | | | | |
| PDSCH parameters (As specified in clause A.3.1.4.1) |  | DL Reference Measurement Channel R.48 FDD | | | DL Reference Measurement Channel R.48 FDD | | | | | | |
| MPDCCH parameters (As specified in clause A.3.1.3.1) |  | DL Reference Measurement Channel R.46 FDD | | | DL Reference Measurement Channel R.46 FDD | | | | | | |
| OCNG Patterns defined in A.3.2.1.21 (OP.21 FDD) and in A.3.2.1.6 (OP.6 FDD) |  | OP.21 FDD | OP.21 FDD | OP.7 FDD | OP.7 FDD | | OP.7 FDD | | | OP.21 FDD | |
| PBCH\_RA | dB | -3 | | | -3 | | | | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
|  | dB | 4 | -Infinity | -Infinity | -Infinity | | | -Infinity | | | 7 |
| Note 2 | dBm/15 KHz | -98 | | | | | | | | | |
|  | dB | 4 | -Infinity | -Infinity | -Infinity | | | -Infinity | | | 7 |
| RSRP Note 3 | dBm/15 KHz | -94 | -Infinity | -Infinity | -Infinity | | | -Infinity | | | -91 |
| Propagation Condition |  | AWGN | | | | | | | | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | | | | | |
| Timing offset to Cell 1 (Asynchronous cells) | Ms | - | | | 3 | | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources 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. | | | | | | | | | | | |

##### A.14.3.1.3.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD inter frequency cell shall be less than 3.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE\_re-establish\_delay.

Where:

TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

Nfreq = 2

Ksatellite,i=1

Tsearch = 1000 ms

TSI-EUTRA-M1-CEModeA = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN FDD cell.

TPRACH = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 3345 ms, allow 3.5 s in the test case.

#### A.14.3.1.4 E-UTRAN HD-FDD Inter-frequency RRC Re-establishment for Cat-M1 UE in CEModeA for Satellite access

##### A.14.3.1.4.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA HD-FDD inter-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in clause 6.7A.2.

The UE shall be provided with the valid information about the SAN serving cells before the test.

The test parameters are given in tables A.14.3.1.4-1, A.14.3.1.4-2 and A.14.3.1.4-3 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the UE shall be indicated with the carrier frequency of Cell 2 to ensure that the UE has the context of the carrier frequency of Cell 2. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of radio link failure. At the start of time period T3, cell 2, which is the neighbour cell, is activated.

Table A.14.3.1.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

Table A.14.3.1.4.1-2: General test parameters for E-UTRAN HD-FDD inter-frequency RRC Re-establishment test case

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | | Unit | Value | Comment |
| Initial conditions | Active cell | |  | Cell 1 |  |
| Neighbouring cell | |  | Cell 2 |  |
| Final condition | Active cell | |  | Cell 2 |  |
| E-UTRA RF Channel Number (cell 1) | | |  | 1 | Only one FDD carrier frequency is used. |
| E-UTRA RF Channel Number (cell 2) | | |  | 2 |  |
| E-UTRA FDD inter-frequency carrier list size | | |  | 1 | 2 E-UTRA FDD carrier frequencies in total: 1 intra-frequency and 1 inter-frequency |
| Satellite information | | Config 1 |  | SSC.1 | GSO |
| Config 2 | SSC.2 | NGSO |
| Channel Bandwidth (BWchannel) | | | MHz | 10 |  |
| PRACH Configuration | | |  | PRACH\_2CE | As specified in A.3.16 |
| N310 | | | - | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | | - | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | | ms | 0 | Radio link failure timer; T310 is disabled |
| T311 | | | ms | 3000 | RRC re-establishment timer |
| DRX | | |  | OFF |  |
| CP length | | |  | Normal |  |
| Access Barring Information | | | - | Not Sent | No additional delays in random access procedure. |
| PRACH configuration index | | |  | 4 | As specified in table 5.7.1-2 in TS 36.211 |
| Time offset between cells | | | ms | 3 | Asynchronous cells |
| T1 | | | s | 5 |  |
| T2 | | | ms | 400 |  |
| T3 | | | s | 3 |  |

Table A.14.3.1.4.1-3: Cell specific test parameters for E-UTRAN HD-FDD inter-frequency RRC Re-establishment test case

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Cell 1 | | | Cell 2 | | | | | | |
| T1 | T2 | T3 | T1 | T2 | | | T3 | | |
| E-UTRA RF Channel Number |  | 1 | | | 2 | | | | | | |
| BWchannel | MHz | 1.4 | | | 1.4 | | | | | | |
| PDSCH parameters (As specified in clause A.3.1.4.2) |  | DL Reference Measurement Channel R.49 HD-FDD | | | DL Reference Measurement Channel R.49 HD-FDD | | | | | | |
| MPDCCH parameters (As specified in clause A.3.1.3.2) |  | DL Reference Measurement Channel R.47 HD-FDD | | | DL Reference Measurement Channel R.47 HD-FDD | | | | | | |
| OCNG Patterns defined in A.3.2.1.21 (OP.21 FDD) and in A.3.2.1.6 (OP.6 FDD) |  | OP.21 FDD | OP.21 FDD | OP.7 FDD | OP.7 FDD | | OP.7 FDD | | | OP.21 FDD | |
| PBCH\_RA | dB | -3 | | | -3 | | | | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
|  | dB | 4 | -Infinity | -Infinity | -Infinity | | | -Infinity | | | 7 |
| Note 2 | dBm/15 KHz | -98 | | | | | | | | | |
|  | dB | 4 | -Infinity | -Infinity | -Infinity | | | -Infinity | | | 7 |
| RSRP Note 3 | dBm/15 KHz | -94 | -Infinity | -Infinity | -Infinity | | | -Infinity | | | -91 |
| Propagation Condition |  | AWGN | | | | | | | | | |
| Antenna Configuration |  | 1x1 | | | 1x1 | | | | | | |
| Timing offset to Cell 1 (Asynchronous cells) | Ms | - | | | 3 | | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources 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. | | | | | | | | | | | |

##### A.14.3.1.4.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD inter frequency cell shall be less than 3.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Tre-establish\_delay= TUL\_grant + TUE\_re-establish\_delay.

Where:

TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence TUL\_grant is not used.

Nfreq = 2

Ksatellite,i=1

Tsearch = 1000 ms

TSI-EUTRA-M1-CEModeA = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN FDD cell.

TPRACH = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 3345 ms, allow 3.5 s in the test case.

## <<< NEXT CHANGE >>>

## A.14.5 UE measurement procedures in RRC\_CONNECTED state for satellite access

The reference channels in this clause assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified.

### A.14.5.1 Intra-frequency measurements for satellite access

#### A.14.5.1.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under AWGN conditions in asynchronous cells for Cat-M1 UE in CEModeA

##### A.14.5.1.1.1 Test Purpose and Environment

The supported test configurations are provided in Table A.14.5.1.1.1-3. The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements for Cat-M1 UE in clause 8.13A.2.1.1.1.

The test parameters are given in Table A.14.5.1.1.1-1 and A.14.5.1.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

Table A.14.5.1.1.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under AWGN conditions in asynchronous cells for Cat-M1 UE in CEModeA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1 | One radio channel is used. |
| Active cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified. |
| CP length | |  | Normal |  |
| DRX | |  | OFF |  |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | S | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 1 |  |
| T1 | | S | 5 |  |
| T2 | | S | 5 |  |

Table A.14.5.1.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under AWGN conditions in asynchronous cells for Cat-M1 UE in CEModeA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| E-UTRA RF Channel Number |  | 1, 2 | 1 | | | |
| Satellite information |  | 1 | SSC.1 | | NSC.3 | |
|  |  | 2 | SSC.2 | | NSC.4 | |
| BWchannel | MHz |  | 1.4 | | | |
| PDSCH parameters:  DL Reference Measurement Channel |  | 1, 2 | R.48 FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | 1, 2 | R.46 FDD | | R.46 FDD | |
| OCNG Patterns |  | 1, 2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | 1, 2 | -3 | | -3 | |
| PBCH\_RB | dB |  |
| PSS\_RA | dB |  |
| SSS\_RA | dB |  |
| PCFICH\_RB | dB |  |
| PHICH\_RA | dB |  |
| PHICH\_RB | dB |  |
| MPDCCH\_RA | dB |  |
| MPDCCH\_RB | dB |  |
| PDSCH\_RA | dB |  |
| PDSCH\_RB | dB |  |
| OCNG\_RANote 1 | dB |  |
| OCNG\_RBNote 1 | dB |  |
| Note 2 | dBm/15 KHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| Note 3 | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
| RSRP Note 3 | dBm/15 KHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| SCH\_RP Note 3 | dBm/15 KHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io Note 3 | dBm/9MHz | 1, 2 | -64.76 | -62.42 | Specified in  Cell 1 columns | |
| Propagation Condition |  | 1, 2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration |  | 1, 2 | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | ms | 1, 2 | - | | 3 | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | |

Table A.14.5.1.1.1-3: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

##### A.14.5.1.1.2 Test Requirements

For test configuration 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 2.88s from the beginning of time period T2.

For test configuration 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5.76s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

#### A.14.5.1.2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under AWGN conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX

##### A.14.5.1.2.1 Test Purpose and Environment

The purpose of the two tests is to verify that the Cat-M1 UE makes correct reporting of an event in DRX. The tests will partly verify the FDD intra-frequency cell search in DRX requirements in clause 8.13A.2.1.1.2.

The supported test configurations are provided in Table A.14.5.1.2.1-5. The test parameters are given in Tables A.14.5.1.2.1-1, A.14.5.1.2.1-2, A.14.5.1.2.1-3 and A.14.5.1.2.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.14.5.1.2.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under AWGN conditions in synchronous cells for Cat-M1 UE when DRX is used

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | | **Comment** |
| **Test1** | **Test2** |
| E-UTRA RF Channel Number | |  | 1 | 1 | One radio channel is used. |
| Active cell | |  | Cell 1 | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell 2 | Cell to be identified. |
| CP length | |  | Normal | Normal |  |
| DRX | |  | ON | ON | DRX related parameters are defined in Table A.14.5.1.2.1-3 |
| A3 | Offset | dB | -6 | -6 |  |
| Hysteresis | dB | 0 | 0 |  |
| Time To Trigger | s | 0 | 0 |  |
| Filter coefficient | |  | 0 | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 0 | 0 |  |
| T1 | | s | 5 | 5 |  |
| T2 | | s | 5 | 30 |  |

**Table A.14.5.1.2.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under AWGN conditions in synchronous cells for Cat-M1 UE when DRX is used**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| E-UTRA RF Channel Number |  | 1, 2 | 1 | | | |
| BWchannel | MHz | 1, 2 | 1.4 | | | |
| Satellite inforamtion |  | 1 | SSC.1 | | NSC.1 | |
|  |  | 2 | SSC.2 | | NSC.2 | |
| PDSCH parameters:  DL Reference Measurement Channel |  | 1, 2 | R.48 FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | 1, 2 | R.46 FDD | | R.46 FDD | |
| OCNG Patterns |  | 1, 2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | 1, 2 | -3 | | -3 | |
| PBCH\_RB | dB |  |
| PSS\_RA | dB |  |
| SSS\_RA | dB |  |
| PCFICH\_RB | dB |  |
| PHICH\_RA | dB |  |
| PHICH\_RB | dB |  |
| MPDCCH\_RA | dB |  |
| MPDCCH\_RB | dB |  |
| PDSCH\_RA | dB |  |
| PDSCH\_RB | dB |  |
| OCNG\_RANote 1 | dB |  |
| OCNG\_RBNote 1 | dB |  |
| Note 2 | dBm/15 KHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| Note 3 | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
| RSRP Note 3 | dBm/15 KHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| SCH\_RP Note 3 | dBm/15 KHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io Note 3 | dBm/9MHz | 1, 2 | -64.76 | -62.42 | Specified in  Cell 1 columns | |
| Propagation Condition |  | 1, 2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration |  | 1, 2 | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | μs | 1, 2 | - | | 3 | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | |

Table A.14.5.1.2.1-3: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under AWGN conditions in synchronous cells for Cat-M1 UE in CEModeA

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Test1** | **Test2** | **Comment** |
| **Value** | **Value** |
| onDurationTimer | psf1 | psf1 | As specified in clause 6.3.2 in TS 36.331 |
| drx-InactivityTimer | psf1 | psf1 |
| drx-RetransmissionTimer | psf1 | psf1 |
| longDRX-CycleStartOffset | sf40 | sf1280 |
| shortDRX | disable | disable |

Table A.14.5.1.2.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under AWGN conditions in synchronous cells for Cat-M1 UE in CEModeA

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Test1** | **Test2** | **Comment** |
| **Value** | **Value** |
| TimeAlignmentTimer | sf500 | sf500 | As specified in clause 6.3.2 in TS 36.331 |
| sr-ConfigIndex | 0 | 0 | For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213. |

Table A.14.5.1.2.1-5: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

##### A.14.5.1.2.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1.44 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

#### A.14.5.1.3 E-UTRAN HD-FDD intra-frequency event triggered reporting under AWGN conditions in asynchronous cells for Cat-M1 UE in CEModeA

##### A.14.5.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event. This test will partly verify the HD-FDD intra-frequency cell search requirements in clause 8.13A.2.1.2.1.

The supported test configurations are provided in Table A.14.5.1.3.1-3. The test parameters are given in Table A.14.5.1.3.1-1 and A.14.5.1.3.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

Table A.14.5.1.3.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under AWGN conditions in asynchronous cells for Cat-M1 UE in CEModeA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1 | One radio channel is used for this test |
| Active Cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified |
| CP length | |  | Normal |  |
| DRX | |  | OFF |  |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 1 |  |
| T1 | | s | 5 |  |
| T2 | | s | 5 |  |

Table A.14.5.1.3.1-2: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under AWGN conditions in asynchronous cells for Cat-M1 UE in CEModeA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| E-UTRA RF Channel Number |  | 1, 2 | 1 | | | |
| BW**channel** | MHz | 1, 2 | 1.4 | | | |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
|  |  | 2 | SSC.2 | | NSC.2 | |
| PDSCH parameters:  DL Reference Measurement Channel |  | 1, 2 | R.49 HD-FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | 1, 2 | R.47 HD-FDD | | R.47 HD-FDD | |
| OCNG Patterns |  | 1, 2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | 1, 2 | -3 | | -3 | |
| PBCH\_RB | dB |  |
| PSS\_RA | dB |  |
| SSS\_RA | dB |  |
| PCFICH\_RB | dB |  |
| PHICH\_RA | dB |  |
| PHICH\_RB | dB |  |
| MPDCCH\_RA | dB |  |
| MPDCCH\_RB | dB |  |
| PDSCH\_RA | dB |  |
| PDSCH\_RB | dB |  |
| OCNG\_RANote 1 | dB |  |
| OCNG\_RBNote 1 | dB |  |
| NocNote 2 | dBm/15 kHz | 1, 2 | -98 | | | |
| Ês/Noc | dB | 1, 2 | 4 | 4 | -infinity | 4 |
| Ês/Iot Note 3 | dB | 1, 2 | 4 | -1.46 | -infinity | -1.46 |
| RSRP Note 3 | dBm/15 kHz | 1, 2 | -94 | -94 | -infinity | -94 |
| SCH\_RP Note 3 | dBm/15 kHz | 1, 2 | -94 | -94 | -infinity | -94 |
| Io Note 3 | dBm/9MHz | 1, 2 | -64.76 | -62.42 | Specified in  Cell 1 columns | |
| Propagation Condition |  | 1, 2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration |  | 1, 2 | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | ms | 1, 2 | - | | 3 | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | |

Table A.14.5.1.3.1-3: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

##### A.14.5.1.3.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 2.88s from the beginning of time period T2.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the tests may be up to 2×TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

#### A.14.5.1.4 E-UTRAN HD-FDD intra-frequency event triggered reporting under AWGN conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX

##### A.14.5.1.4.1 Test Purpose and Environment

The purpose of the two tests is to verify that the Cat-M1 UE makes correct reporting of an event in DRX. The tests will partly verify the HD-FDD intra-frequency cell search in DRX requirements in clause 8.13A.2.1.2.2.

The supported test configurations are provided in Table A.14.5.1.4.1-5. The test parameters are given in Tables A.14.5.1.4.1-1, A.14.5.1.4.1-2, A.14.5.1.4.1-3 and A.14.5.1.4.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.14.5.1.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under AWGN conditions in synchronous cells for Cat-M1 UE in CEModeA when DRX is used

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | | **Comment** |
| **Test1** | **Test2** |  |
| E-UTRA RF Channel Number | |  | 1 | 1 | One radio channel is used for this test |
| Active cell | |  | Cell 1 | Cell1 |  |
| Neighbour cell | |  | Cell 2 | Cell2 | Cell to be identified. |
| CP length | |  | Normal | Normal |  |
| DRX | |  | ON | ON | DRX related parameters are defined in Table A.14.5.1.4.1-3 |
| A3 | Offset | dB | -6 | -6 |  |
| Hysteresis | dB | 0 | 0 |  |
| Time To Trigger | s | 0 | 0 |  |
| Filter coefficient | |  | 0 | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 0 | 0 | As specified in TS 36.133 clause 8.1.2.1. |
| T1 | | s | 5 | 5 |  |
| T2 | | s | 5 | 35 |  |

Table A.14.5.1.4.1-2: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under AWGN conditions in synchronous cells for Cat-M1 UE in CEModeA when DRX is used

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| E-UTRA RF Channel Number |  | 1, 2 | 1 | | | |
| BWchannel | MHz | 1, 2 | 1.4 | | | |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
|  |  | 2 | SSC.2 | | NSC.2 | |
| PDSCH parameters:  DL Reference Measurement Channel |  | 1, 2 | R.49 HD-FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | 1, 2 | R.47 HD-FDD | | R.47 HD-FDD | |
| OCNG Patterns |  | 1, 2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | 1, 2 | -3 | | -3 | |
| PBCH\_RB | dB |  |
| PSS\_RA | dB |  |
| SSS\_RA | dB |  |
| PCFICH\_RB | dB |  |
| PHICH\_RA | dB |  |
| PHICH\_RB | dB |  |
| MPDCCH\_RA | dB |  |
| MPDCCH\_RB | dB |  |
| PDSCH\_RA | dB |  |
| PDSCH\_RB | dB |  |
| OCNG\_RANote 1 | dB |  |
| OCNG\_RBNote 1 | dB |  |
| Note 2 | dBm/15 KHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| Note 3 | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
| RSRP Note 3 | dBm/15 KHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| SCH\_RP Note 3 | dBm/15 KHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io Note 3 | dBm/9MHz | 1, 2 | -64.76 | -62.42 | Specified in  Cell 1 columns | |
| Propagation Condition |  | 1, 2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration |  | 1, 2 | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | μs | 1, 2 | - | | 3 | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | |

Table A.14.5.1.4.1-3: DRX-Configuration for E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under AWGN conditions in synchronous cells for Cat-M1 UE in CEModeA

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Test1** | **Test2** | **Comment** |
| **Value** | **Value** |
| onDurationTimer | psf1 | psf1 | As specified in clause 6.3.2 in TS 36.331 |
| drx-InactivityTimer | psf1 | psf1 |
| drx-RetransmissionTimer | psf1 | psf1 |
| longDRX-CycleStartOffset | sf40 | sf1280 |
| shortDRX | disable | disable |

Table A.14.5.1.4.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under AWGN conditions in synchronous cells for Cat-M1 UE in CEModeA

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Test1** | **Test2** | **Comment** |
| **Value** | **Value** |
| TimeAlignmentTimer | sf500 | sf500 | As specified in clause 6.3.2 in TS 36.331 |
| sr-ConfigIndex | 30 | 30 | For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213. |

Table A.14.5.1.4.1-5: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

##### A.14.5.1.4.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1.44 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 32 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

## <<< NEXT CHANGE >>>

#### A.14.5.1.5 E-UTRAN FD-FDD Intra-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA with location-based triggering

##### A.14.5.1.5.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements for Cat-M1 UE in clause 8.13A.2.1.1.1.

The test parameters are given in Table A.14.5.1.5.1-1 and A.14.5.1.5.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with EventD1 is used. Parameters *referenceLocation1, referenceLocation2, distanceThreshFromReference1, distanceThreshFromReference2* are configured in eventD1. The test consists of two successive time periods, with time duration of T1, and T2 respectively.

During time duration T1, the UE shall not have any timing information of cell 2. And the UE location shall be set such that the distance between UE and the reference location *referenceLocation1* is shorter than d*istanceThreshFromReference1* and distance between UE and a reference location *referenceLocation2* is larger than configured threshold *distanceThreshFromReference2.*

At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1. The position of the UE shall also be updated in the test environment such that the distance between UE and a reference location *referenceLocation1* becomes larger than configured threshold *distanceThreshFromReference1* and distance between UE and a reference location *referenceLocation2* becomes shorter than configured threshold *distanceThreshFromReference2.* This shall result in reporting of eventA1.

Table A.14.5.1.5.1-1: General test parameters for E-UTRAN FD-FDD Intra-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA with location-based triggering

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1 | One radio channel is used. |
| Satellite Orbit Configuration | |  | NGSO |  |
| Active cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified. |
| CP length | |  | Normal |  |
| DRX | |  | OFF |  |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | S | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 1 |  |
| T1 | | S | 5 |  |
| T2 | | S | 5 |  |

Table A.14.5.1.5.1-2: Cell specific test parameters for E-UTRAN FD-FDD Intra-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA with location-based triggering

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | **Cell 2** | | |
| **T1** | **T2** | **T1** | | **T2** |
| E-UTRA RF Channel Number |  | 1 | | | | |
| Satellite Assistance Information (Clause B.3.8) |  | SSC.2 | | | NSC.2 | |
| BWchannel | MHz | 1.4 | | | | |
| PDSCH parameters:  DL Reference Measurement Channel |  | R.48 FDD | | - | | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | R.46 FDD | | R.46 FDD | | |
| OCNG Patterns |  | OP.21 FDD | | OP.6 FDD | | |
| PBCH\_RA | dB | -3 | | -3 | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Note 2 | dBm/15 KHz | -98 | | | | |
|  | dB | 4 | 4 | -Infinity | | 4 |
| Note 3 | dB | 4 | -1.46 | -Infinity | | -1.46 |
| RSRP Note 3 | dBm/15 KHz | -94 | -94 | -Infinity | | -94 |
| SCH\_RP Note 3 | dBm/15 KHz | -94 | -94 | -Infinity | | -94 |
| Io Note 3 | dBm/9MHz | -64.76 | -62.42 | Specified in  Cell 1 columns | | |
| Propagation Condition |  | AWGN | | AWGN | | |
| Correlation Matrix and Antenna Configuration |  | 1x1 Low | | 1x1 Low | | |
| Timing offset to Cell 1 | ms | - | | 3 | | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | |

##### A.14.5.1.5.2 Test Requirements

The UE shall send one Event D1 triggered measurement report, with a measurement reporting delay less than 2.88s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

#### A.14.5.1.6 E-UTRAN HD-FDD Intra-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA with location-based triggering

##### A.14.5.1.6.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event. This test will partly verify the HD-FDD intra-frequency cell search requirements in clause 8.13A.2.1.2.1.

The test parameters are given in Table A.14.5.1.6.1-1 and A.14.5.1.6.1-2 below In the measurement control information it is indicated to the UE that event-triggered reporting with EventD1 is used. Parameters *referenceLocation1, referenceLocation2, distanceThreshFromReference1, distanceThreshFromReference2* are configured in eventD1. The test consists of two successive time periods, with time duration of T1, and T2 respectively.

During time duration T1, the UE shall not have any timing information of cell 2. And the UE location shall be set such that the distance between UE and the reference location *referenceLocation1* is shorter than d*istanceThreshFromReference1* and distance between UE and a reference location *referenceLocation2* is larger than configured threshold *distanceThreshFromReference2.*

At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1. The position of the UE shall also be updated in the test environment such that the distance between UE and a reference location *referenceLocation1* becomes larger than configured threshold *distanceThreshFromReference1* and distance between UE and a reference location *referenceLocation2* becomes shorter than configured threshold *distanceThreshFromReference2.* This shall result in reporting of eventA1.

.

Table A.14.5.1.6.1-1: General test parameters for E-UTRAN HD-FDD Intra-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA with location-based triggering

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1 | One radio channel is used for this test |
| Satellite Orbit Configuration | |  | NGSO |  |
| Active Cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified |
| CP length | |  | Normal |  |
| DRX | |  | OFF |  |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 1 |  |
| T1 | | s | 5 |  |
| T2 | | s | 5 |  |

Table A.14.5.1.6.1-2: Cell specific test parameters for E-UTRAN HD-FDD Intra-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA with location-based triggering

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| E-UTRA RF Channel Number |  | 1 | | | |
| Satellite Assistance Information (Clause B.3.8) |  | SSC.2 | | NSC.2 | |
| BW**channel** | MHz | 1.4 | | | |
| PDSCH parameters:  DL Reference Measurement Channel |  | R.49 HD-FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | R.47 HD-FDD | | R.47 HD-FDD | |
| OCNG Patterns |  | OP.21 FDD | | OP.6 FDD | |
| PBCH\_RA | dB | -3 | | -3 | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| NocNote 2 | dBm/15 kHz | -98 | | | |
| Ês/Noc | dB | 4 | 4 | -infinity | 4 |
| Ês/Iot Note 3 | dB | 4 | -1.46 | -infinity | -1.46 |
| RSRP Note 3 | dBm/15 kHz | -94 | -94 | -infinity | -94 |
| SCH\_RP Note 3 | dBm/15 kHz | -94 | -94 | -infinity | -94 |
| Io Note 3 | dBm/9MHz | -64.76 | -62.42 | Specified in  Cell 1 columns | |
| Propagation Condition |  | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration |  | 1x1 Low | | 1x1 Low | |
| Timing offset to Cell 1 | ms | - | | 3 | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | |

##### A.14.5.1.6.2 Test Requirements

The UE shall send one Event D1 triggered measurement report, with a measurement reporting delay less than 2.88s from the beginning of time period T2.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the tests may be up to 2×TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

#### A.14.5.1.7 E-UTRAN HD-FDD Intra-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA when DRX is used with time-based triggering

##### A.14.5.1.7.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting when *t-serviceStartNeigh* is configured. This test will partly verify the FDD intra-frequency cell search requirements for Cat-M1 UE in clause 8.13A.2.1.1.1.

The test parameters are given in Table A.14.5.1.7.1-1 and A.14.5.1.7.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with EventA3 is used. The test consists of four successive time periods, with time duration of T1, T2, T3 and T4 respectively.

During time duration T1, the UE shall not have any timing information of cell 2. The assistance information provided for cell 2 indicates that *t-serviceStartNeigh* happens at the beginning of time T4.

At the beginning of T2 the transmission power of cell 2, configured in a different satellite, is increased to the same level as for cell 1. As the UE has not reached *t-serviceStartNeigh* for this frequency layer, UE shall skip the measurement gaps in this interval and no report is made.

At the beginning of T3 the transmission power of cell 2 is turned down, such that it become an unknown cell for the UE after 5 seconds.

At the beginning of T4, the transmission power of cell 2 increased to the same level as for cell 1. This shall result in reporting of event A3.

Table A.14.5.1.7.1-1: General test parameters for E-UTRAN HD-FDD Intra-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA when DRX is used with time-based triggering

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1 |  |
| Satellite Orbit Configuration | |  | NGSO |  |
| Active cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified. |
| CP length | |  | Normal |  |
| DRX | |  | ON |  |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 1 |  |
| T1 | | s | 5 |  |
| T2 | | s | 8 |  |
| T3 | | s | >5 |  |
| T4 | | s | 8 |  |

Table A.14.5.1.7.1-2: Cell specific test parameters for E-UTRAN HD-FDD Intra-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA when DRX is used with time-based triggering

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | | **Cell 2** | | | |
| **T1** | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** |
| E-UTRA RF Channel Number |  | 1 | | | | 1 | | | |
| Satellite Assistance Information (Clause A.3.28.5) |  | SSC.2 | | | | NSC.4 | | | |
| BWchannel | MHz | 1.4 | | | | | | | |
| PDSCH parameters:  DL Reference Measurement Channel |  | R.49 FDD | | | | R.49 FDD | | | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | R.47 FDD | | | | R.47 FDD | | | |
| OCNG Patterns |  | OP.7 FDD | | | | OP.7 FDD | | | |
| PBCH\_RA | dB | -3 | | | | -3 | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Note 2 | dBm/15 KHz | -98 | | | | | | | |
|  | dB | 4 | 4 | 4 | 4 | -Infinity | 4 | -Infinity | 4 |
| Note 3 | dB | 4 | -1.46 | 4 | -1.46 | -Infinity | -1.46 | -Infinity | -1.46 |
| RSRP Note 3 | dBm/15 KHz | -94 | -94 | -94 | -94 | -Infinity | -94 | -Infinity | -94 |
| Io Note 3 | dBm/9MHz | -64.76 | -62.42 | -64.76 | -62.42 | Specified in  Cell 1 columns | | | |
| Propagation Condition |  | AWGN | | | | AWGN | | | |
| Correlation Matrix and Antenna Configuration |  | 1x1 Low | | | | 1x1 Low | | | |
| Timing offset to Cell 1 | ms | - | | | | 3 | | | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | | | | |

##### A.14.5.1.7.2 Test Requirements

The UE shall send one Event D1 triggered measurement report, with a measurement reporting delay less than 6.4s from the beginning of time period T4.

NOTE: The delay time is calculated as (3.2 \* Kintra\_M1 \*  Ksatellite\_intra\_i  ) seconds, according to 8.13A.2.1, with Ksatellite\_intra\_i =2).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

## <<< NEXT CHANGE >>>

### A.14.5.2 Inter-frequency measurements for satellite access

#### A.14.5.2.1 E-UTRAN FD-FDD Inter-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA when DRX is used with time-based triggering

##### A.14.5.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting when *t-serviceStartNeigh* is configured. This test will partly verify the FDD inter-frequency cell search requirements for Cat-M1 UE in clause 8.13A.2.1.1.1.

The test parameters are given in Table A.14.5.2.1.1-1 and A.14.5.2.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with EventA3 is used. The test consists of four successive time periods, with time duration of T1, T2, T3 and T4 respectively.

During time duration T1, the UE shall not have any timing information of cell 2. The assistance information provided for cell 2 indicates that *t-serviceStartNeigh* happens at the beginning of time T4.

At the beginning of T2 the transmission power of cell 2, configured in a different satellite, is increased to the same level as for cell 1. As the UE has not reached *t-serviceStartNeigh* for this frequency layer, UE shall skip the measurement gaps in this interval and no report is made.

At the beginning of T3 the transmission power of cell 2 is turned down, such that it become an unknown cell for the UE after 5 seconds.

At the beginning of T4, the transmission power of cell 2 increased to the same level as for cell 1. This shall result in reporting of event A3.

Table A.14.5.2.1.1-1: General test parameters for E-UTRAN FD-FDD Inter-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA when DRX is used with time-based triggering

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1,2 |  |
| Satellite Orbit Configuration | |  | NGSO |  |
| Active cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified. |
| CP length | |  | Normal |  |
| DRX | |  | ON |  |
| DRX cycle length | | s | 1.28 | The value shall be used for all cells in the test. |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 1 |  |
| T1 | | s | 5 |  |
| T2 | | s | 8 |  |
| T3 | | s | >5 |  |
| T4 | | s | 8 |  |

Table A.14.5.2.1.1-2: Cell specific test parameters for E-UTRAN FD-FDD Inter-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA when DRX is used with time-based triggering

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | | **Cell 2** | | | |
| **T1** | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** |
| E-UTRA RF Channel Number |  | 1 | | | | 2 | | | |
| Satellite Assistance Information (Clause A.3.28.5) |  | SSC.2 | | | | NSC.4 | | | |
| BWchannel | MHz | 1.4 | | | | | | | |
| PDSCH parameters:  DL Reference Measurement Channel |  | R.48 FDD | | | | R.48 FDD | | | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | R.46 FDD | | | | R.46 FDD | | | |
| OCNG Patterns |  | OP.7 FDD | | | | OP.7 FDD | | | |
| PBCH\_RA | dB | -3 | | | | -3 | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| Note 2 | dBm/15 KHz | -98 | | | | | | | |
|  | dB | 4 | 4 | 4 | 4 | -Infinity | 4 | -Infinity | 4 |
| Note 3 | dB | 4 | -1.46 | 4 | -1.46 | -Infinity | -1.46 | -Infinity | -1.46 |
| RSRP Note 3 | dBm/15 KHz | -94 | -94 | -94 | -94 | -Infinity | -94 | -Infinity | -94 |
| Io Note 3 | dBm/9MHz | -64.76 | -62.42 | -64.76 | -62.42 | Specified in  Cell 1 columns | | | |
| Propagation Condition |  | AWGN | | | | AWGN | | | |
| Correlation Matrix and Antenna Configuration |  | 1x1 Low | | | | 1x1 Low | | | |
| Timing offset to Cell 1 | ms | - | | | | 3 | | | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | | | | |

##### A.14.5.2.1.2 Test Requirements

The UE shall send one Event D1 triggered measurement report, with a measurement reporting delay less than 3.2s from the beginning of time period T4.

NOTE: The delay time is calculated as (3.2 \* Kinter\_M1 \*  Ksatellite\_inter\_i  ) seconds, according to 8.13A.2.2, with Ksatellite\_inter\_i =1).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

#### A.14.5.2.2 E-UTRAN HD-FDD Inter-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA when DRX is used with time-based triggering

##### A.14.5.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event. This test will partly verify the HD-FDD inter-frequency cell search requirements in clause 8.13A.2.1.2.1.

The test parameters are given in Table A.14.5.2.2.1-1 and A.14.5.2.2.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with EventA3 is used. The test consists of four successive time periods, with time duration of T1, T2, T3 and T4 respectively.

During time duration T1, the UE shall not have any timing information of cell 2. The assistance information provided for cell 2 indicates that *t-serviceStartNeigh* happens at the beginning of time T4.

At the beginning of T2 the transmission power of cell 2, configured in a different satellite, is increased to the same level as for cell 1. As the UE has not reached *t-serviceStartNeigh* for this frequency layer, UE shall skip the measurement gaps in this interval and no report is made.

At the beginning of T3 the transmission power of cell 2 is turned down, such that it become an unknown cell for the UE after 5 seconds.

At the beginning of T4, the transmission power of cell 2 increased to the same level as for cell 1. This shall result in reporting of event A3.

.

Table A.14.5.2.2.1-1: General test parameters for E-UTRAN HD-FDD Inter-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA when DRX is used with time-based triggering

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1,2 |  |
| Satellite Orbit Configuration | |  | NGSO |  |
| Active Cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified |
| CP length | |  | Normal |  |
| DRX | |  | ON |  |
| DRX Cycle | |  | 1.28 | The value shall be used for all cells in the test. |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 1 |  |
| T1 | | s | 5 |  |
| T2 | | s | 8 |  |
| T3 | | s | >5 |  |
| T4 | | s | 8 |  |

Table A.14.5.2.2.1-2: E-UTRAN HD-FDD Inter-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeA when DRX is used with time-based triggering

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | | **Cell 2** | | | |
| **T1** | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** |
| E-UTRA RF Channel Number |  | 1 | | | | 2 | | | |
| Satellite Assistance Information (Clause A.3.28.5) |  | SSC.2 | | | | NSC.4 | | | |
| BW**channel** | MHz | 1.4 | | | | | | | |
| PDSCH parameters:  DL Reference Measurement Channel |  | R.49 HD-FDD | | | | R.49 HD-FDD | | | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | R.47 HD-FDD | | | | R.47 HD-FDD | | | |
| OCNG Patterns |  | OP.7 FDD | | | | OP.7 FDD | | | |
| PBCH\_RA | dB | -3 | | | | -3 | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| NocNote 2 | dBm/15 kHz | -98 | | | | | | | |
| Ês/Noc | dB | 4 | 4 | 4 | 4 | -infinity | 4 | -infinity | 4 |
| Ês/Iot Note 3 | dB | 4 | -1.46 | 4 | -1.46 | -infinity | -1.46 | -infinity | -1.46 |
| RSRP Note 3 | dBm/15 kHz | -94 | -94 | -94 | -94 | -infinity | -94 | -infinity | -94 |
| Io Note 3 | dBm/9MHz | -64.76 | -62.42 | -64.76 | -62.42 | Specified in  Cell 1 columns | | | |
| Propagation Condition |  | AWGN | | | | AWGN | | | |
| Correlation Matrix and Antenna Configuration |  | 1x1 Low | | | | 1x1 Low | | | |
| Timing offset to Cell 1 | ms | - | | | | 3 | | | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | | | | |

##### A.14.5.2.2.2 Test Requirements

The UE shall send one Event D1 triggered measurement report, with a measurement reporting delay less than 3.2s from the beginning of time period T4.

NOTE: The delay time is calculated as (3.2 \* Kinter\_M1 \*  Ksatellite\_inter\_i  ) seconds, according to 8.13A.2.2, with Ksatellite\_inter\_i =1).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the tests may be up to 2×TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

#### A.14.5.2.3 E-UTRAN HD-FDD Inter-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeB when DRX is used with time-based triggering

##### A.14.5.2.3.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event. This test will partly verify the HD-FDD inter-frequency cell search requirements in clause 8.13A.2.1.2.1.

The test parameters are given in Table A.14.5.2.3.1-1 and A.14.5.2.3.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with EventA3 is used. The test consists of four successive time periods, with time duration of T1, T2, T3 and T4 respectively.

During time duration T1, the UE shall not have any timing information of cell 2. The assistance information provided for cell 2 indicates that *t-serviceStartNeigh* happens at the beginning of time T4.

At the beginning of T2 the transmission power of cell 2, configured in a different satellite, is increased to the same level as for cell 1. As the UE has not reached *t-serviceStartNeigh* for this frequency layer, UE shall skip the measurement gaps in this interval and no report is made.

At the beginning of T3 the transmission power of cell 2 is turned down, such that it become an unknown cell for the UE after 5 seconds.

At the beginning of T4, the transmission power of cell 2 increased to the same level as for cell 1. This shall result in reporting of event A3.

.

Table A.14.5.2.3.1-1: General test parameters for E-UTRAN HD-FDD Inter-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeB when DRX is used with time-based triggering

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1,2 |  |
| Satellite Orbit Configuration | |  | NGSO |  |
| Active Cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified |
| CP length | |  | Normal |  |
| DRX | |  | ON |  |
| DRX Cycle | |  | 0.64 | The value shall be used for all cells in the test. |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | s | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 1 |  |
| T1 | | s | 5 |  |
| T2 | | s | 20 |  |
| T3 | | s | >5 |  |
| T4 | | s | 15 |  |

Table A.14.5.2.3.1-2: Cell specific test parameters for E-UTRAN HD-FDD Inter-frequency event triggered reporting in asynchronous cells for UE category M1 in CEModeB when DRX is used with time-based triggering

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | | **Cell 2** | | | |
| **T1** | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** |
| E-UTRA RF Channel Number |  | 1 | | | | 2 | | | |
| Satellite Assistance Information (Clause A.3.28.5) |  | SSC.2 | | | | NSC.4 | | | |
| BW**channel** | MHz | 1.4 | | | | | | | |
| PDSCH parameters:  DL Reference Measurement Channel |  | R.53 HD-FDD | | | | R.53 HD-FDD | | | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | R.51 HD-FDD | | | | R.51 HD-FDD | | | |
| OCNG Patterns |  | OP.7 FDD | | | | OP.7 FDD | | | |
| PBCH\_RA | dB | -3 | | | | -3 | | | |
| PBCH\_RB | dB |
| PSS\_RA | dB |
| SSS\_RA | dB |
| PCFICH\_RB | dB |
| PHICH\_RA | dB |
| PHICH\_RB | dB |
| MPDCCH\_RA | dB |
| MPDCCH\_RB | dB |
| PDSCH\_RA | dB |
| PDSCH\_RB | dB |
| OCNG\_RANote 1 | dB |
| OCNG\_RBNote 1 | dB |
| NocNote 2 | dBm/15 kHz | -98 | | | | | | | |
| Ês/Noc | dB | -12 | -12 | -12 | -12 | -infinity | -4 | -infinity | -4 |
| Ês/Iot Note 3 | dB | -12 | -12 | -12 | -12 | -infinity | -4 | -infinity | -4 |
| RSRP Note 3 | dBm/15 kHz | -110 | -110 | -110 | -110 | -infinity | -102 | -infinity | -102 |
| Io Note 3 | dBm/9MHz | -69.95 | -69.21 | -69.95 | -69.21 | Specified in  Cell 1 columns | | | |
| Propagation Condition |  | AWGN | | | | AWGN | | | |
| Correlation Matrix and Antenna Configuration |  | 1x1 Low | | | | 1x1 Low | | | |
| Timing offset to Cell 1 | ms | - | | | | 3 | | | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | | | | |

##### A.14.5.2.3.2 Test Requirements

The UE shall send one Event D1 triggered measurement report, with a measurement reporting delay less than 14.5s from the beginning of time period T4.

NOTE: The delay time is calculated as (22.6 \* Kinter\_M1 \*  Ksatellite\_inter\_i  ) cycles, according to 8.13A.3.2, with Ksatellite\_inter\_i =1).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the tests may be up to 2×TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

## <<< NEXT CHANGE >>>

#### A.14.5.2.X1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under AWGN conditions in asynchronous cells for UE category M1 with discontinuous MPDCCH monitoring in CEModeA

##### A.14.5.2.X1.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event with discontinuous MPDCCH monitoring. This test will partly verify the FDD-FDD inter-frequency cell search requirements in clause 8.13A.2.2.1. The supported test configurations are provided in Table A.14.5.2.X1.1-1.

Table A.14.5.2.X1.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test parameters are given in Table A.14.5.2.X1.1-2 and A.14.5.2.X1.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

Table A.14.5.2.X1.1-2: General test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| E-UTRA RF Channel Number | |  | 1, 2 |  |
| Active cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified. |
| CP length | |  | Normal |  |
| DRX | |  | OFF |  |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | S | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 0 |  |
| *Rmax* | |  | 8 | As defined in *mPDCCH-NumRepetition* in [3] |
| *G* | |  | 10 | As defined in *mPDCCH-startSF-UESS* in [3] |
| *X* | |  | scheme10 | As defined in *measGapSharingScheme* in [3] |
| T1 | | S | 5 |  |
| T2 | | S | 5 |  |

Table A.14.5.2.X1.1-3: Cell specific test parameters

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configurations | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information |  | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  | 2 | SSC.2 | SSC.2 | NSC.2 | NSC.2 |
| E-UTRA RF Channel Number |  |  | 1 | | 2 | |
| BWchannel | MHz | 1,2 | 1.4 | | 1.4 | |
| PDSCH parameters:  DL Reference Measurement Channel |  | 1,2 | R.48 FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | 1,2 | R.46 FDD | | R.46 FDD | |
| OCNG Patterns |  | 1,2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | 1,2 | -3 | | -3 | |
| PBCH\_RB | dB | 1,2 |
| PSS\_RA | dB | 1,2 |
| SSS\_RA | dB | 1,2 |
| PCFICH\_RB | dB | 1,2 |
| PHICH\_RA | dB | 1,2 |
| PHICH\_RB | dB | 1,2 |
| MPDCCH\_RA | dB | 1,2 |
| MPDCCH\_RB | dB | 1,2 |
| PDSCH\_RA | dB | 1,2 |
| PDSCH\_RB | dB | 1,2 |
| OCNG\_RANote 1 | dB | 1,2 |
| OCNG\_RBNote 1 | dB | 1,2 |
| Note 2 | dBm/15 KHz | 1,2 | -98 | | | |
|  | dB | 1,2 | 4 | 4 | -Infinity | 4 |
| Note 3 | dB | 1,2 | 4 | 4 | -Infinity | 4 |
| RSRP Note 3 | dBm/15 KHz | 1,2 | -94 | -94 | -Infinity | -94 |
| SCH\_RP Note 3 | dBm/15 KHz | 1,2 | -94 | -94 | -Infinity | -94 |
| Io Note 3 | dBm/9MHz | 1,2 | -64.76 | -64.76 | -Infinity | -64.76 |
| Propagation Condition |  | 1,2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration |  | 1,2 | 1X1 | | 1X1 | |
| Timing offset to Cell 1 | ms | 1,2 | - | | 3 | |
| Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | |

##### A.14.5.2.X1.2 Test Requirement

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3.2 s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

#### A.14.5.2.X2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under AWGN conditions in asynchronous cells for UE category M1 in CEModeA when DRX is used

##### A.14.5.2.X2.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event for inter-frequency. This test will partly verify the FDD-FDD inter-frequency cell search requirements in clause 8.13A.2.2.1. The supported test configurations are provided in Table A.14.5.2.X2.1-1.

Table A.14.5.2.X2.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test parameters are given in Table A.14.5.2.X2.1-2, A.14.5.2.X2.1-3 and A.14.5.2.X2.1-4 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furhtermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time aligment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.14.5.2.X2.1-2: General test parameters

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | | Comment |
| Test1 | Test2 |
| E-UTRA RF Channel Number | |  | 1, 2 | |  |
| Active cell | |  | Cell 1 | |  |
| Neighbour cell | |  | Cell 2 | | Cell to be identified. |
| CP length | |  | Normal | |  |
| DRX | |  | ON | |  |
| A3 | Offset | dB | -6 | |  |
| Hysteresis | dB | 0 | |  |
| Time To Trigger | S | 0 | |  |
| Filter coefficient | |  | 0 | | L3 filtering is not used |
| Gap pattern ID | |  | 0 | |  |
| *Rmax* | |  | 8 | | As defined in *mPDCCH-NumRepetition* in [3] |
| *G* | |  | 1 | | As defined in *mPDCCH-startSF-UESS* in [3] |
| *X* | |  | scheme10 | | As defined in *measGapSharingScheme* in [3] |
| T1 | | S | 5 | |  |
| T2 | | S | 10 | 60 |  |

Table A.14.5.2.X2.1-3: Cell specific test parameters

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | | Test configurations | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information |  | | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  | | 2 | SSC.2 | SSC.2 | NSC.2 | NSC.2 |
| E-UTRA RF Channel Number |  | | 1,2 | 1 | | 2 | |
| BWchannel | MHz | | 1,2 | 1.4 | | 1.4 | |
| PDSCH parameters:  DL Reference Measurement Channel |  | | 1,2 | R.48 FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | | 1,2 | R.46 FDD | | R.46 FDD | |
| OCNG Patterns |  | | 1,2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | | 1,2 | -3 | | -3 | |
| PBCH\_RB | dB | | 1,2 |
| PSS\_RA | dB | | 1,2 |
| SSS\_RA | dB | | 1,2 |
| PCFICH\_RB | dB | | 1,2 |
| PHICH\_RA | dB | | 1,2 |
| PHICH\_RB | dB | | 1,2 |
| MPDCCH\_RA | dB | | 1,2 |
| MPDCCH\_RB | dB | | 1,2 |
| PDSCH\_RA | dB | | 1,2 |
| PDSCH\_RB | dB | | 1,2 |
| OCNG\_RANote 1 | dB | | 1,2 |
| OCNG\_RBNote 1 | dB | | 1,2 |
| Note 2 | dBm/15 KHz | | 1,2 | -98 | | -98 | |
|  | dB | | 1,2 | 4 | 4 | -Infinity | 4 |
| Note 3 | dB | | 1,2 | 4 | 4 | -Infinity | 4 |
| RSRP Note 3 | dBm/15 KHz | | 1,2 | -94 | -94 | -Infinity | -94 |
| SCH\_RP Note 3 | dBm/15 KHz | | 1,2 | -94 | -94 | -Infinity | -94 |
| Io Note 3 | dBm/9MHz | | 1,2 | -64.76 | -64.76 | -Infinity | -64.76 |
| Propagation Condition |  | | 1,2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration |  | | 1,2 | 1X1 | | 1X1 | |
| Timing offset to Cell 1 | ms | | 1,2 | - | | 3 | |
|  | | Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | |

Table A.14.5.2.X2.1-4: DRX-Configuration

|  |  |  |  |
| --- | --- | --- | --- |
| Field | Test1 | Test2 | Comment |
| Value | Value |
| onDurationTimer | psf1 | psf1 | As specified in clause 6.3.2 in TS 36.331 |
| drx-InactivityTimer | psf1 | psf1 |
| drx-RetransmissionTimer | psf1 | psf1 |
| longDRX-CycleStartOffset | sf128 | sf1280 |
| shortDRX | disable | disable |

Table A.14.5.2.X2.1-4: *TimeAlignmentTimer* -Configuration

|  |  |  |  |
| --- | --- | --- | --- |
| Field | Test1 | Test2 | Comment |
| Value | Value |
| TimeAlignmentTimer | sf500 | sf500 | As specified in clause 6.3.2 in TS 36.331 |
| sr-ConfigIndex | 0 | 0 | For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213. |

##### A.14.5.2.X2.2 Test Requirement

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6.4 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 51.2 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

#### A.14.5.2.X3 E-UTRAN HD-FDD Inter-frequency event triggered reporting under AWGN conditions in asynchronous cells for UE category M1 with discontinuous MPDCCH monitoring in CEModeA

##### A.14.5.2.X3.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event with discontinuous MPDCCH monitoring. This test will partly verify the HD-FDD inter-frequency cell search requirements in clause 8.13A.2.2.2. The supported test configurations are provided in Table A.14.5.2.X3.1-1.

Table A.14.5.2.X3.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test parameters are given in Table A.14.5.2.X3.1-2 and A.14.5.2.X3.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

Table A.14.5.2.X3.1-2: General test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| E-UTRA RF Channel Number | |  | 1, 2 |  |
| Active cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified. |
| CP length | |  | Normal |  |
| DRX | |  | OFF |  |
| A3 | Offset | dB | -6 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | S | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 0 |  |
| *Rmax* | |  | 8 | As defined in *mPDCCH-NumRepetition* in [3] |
| *G* | |  | 10 | As defined in *mPDCCH-startSF-UESS* in [3] |
| *X* | |  | scheme10 | As defined in *measGapSharingScheme* in [3] |
| T1 | | S | 5 |  |
| T2 | | S | 5 |  |

Table A.14.5.2.X3.1-3: Cell specific test parameters

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | | Test configurations | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information |  | | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  | | 2 | SSC.2 | SSC.2 | NSC.2 | NSC.2 |
| E-UTRA RF Channel Number |  | | 1,2 | 1 | | 2 | |
| BWchannel | MHz | | 1,2 | 1.4 | | 1.4 | |
| PDSCH parameters:  DL Reference Measurement Channel |  | | 1,2 | R.49 HD-FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel |  | | 1,2 | R.47 HD-FDD | | R.47 HD-FDD | |
| OCNG Patterns |  | | 1,2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | dB | | 1,2 | -3 | | -3 | |
| PBCH\_RB | dB | | 1,2 |
| PSS\_RA | dB | | 1,2 |
| SSS\_RA | dB | | 1,2 |
| PCFICH\_RB | dB | | 1,2 |
| PHICH\_RA | dB | | 1,2 |
| PHICH\_RB | dB | | 1,2 |
| MPDCCH\_RA | dB | | 1,2 |
| MPDCCH\_RB | dB | | 1,2 |
| PDSCH\_RA | dB | | 1,2 |
| PDSCH\_RB | dB | | 1,2 |
| OCNG\_RANote 1 | dB | | 1,2 |
| OCNG\_RBNote 1 | dB | | 1,2 |
| Note 2 | dBm/15 KHz | | 1,2 | -98 | | | |
|  | dB | | 1,2 | 4 | 4 | -Infinity | 4 |
| Note 3 | dB | | 1,2 | 4 | 4 | -Infinity | 4 |
| RSRP Note 3 | dBm/15 KHz | | 1,2 | -94 | -94 | -Infinity | -94 |
| SCH\_RP Note 3 | dBm/15 KHz | | 1,2 | -94 | -94 | -Infinity | -94 |
| Io Note 3 | dBm/9MHz | | 1,2 | -64.76 | -64.76 | -Infinity | -64.76 |
| Propagation Condition |  | | 1,2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration |  | | 1,2 | 1X1 | | 1X1 | |
| Timing offset to Cell 1 | ms | | 1,2 | - | | 3 | |
|  | | Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | |

##### A.14.5.2.X3.2 Test Requirement

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3.2 s from the beginning of time period T2. During the test, downlink traffic is continuously scheduled.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

#### A.14.5.2.X4 E-UTRAN HD-FDD inter-frequency event triggered reporting under AWGN conditions in asynchronous cells for UE category M1 in CEModeA in DRX

##### A.14.5.2.X4.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event. This test will partly verify the HD-FDD inter-frequency cell search requirements in clause 8.13A.2.2.2. The supported test configurations are provided in Table A.14.5.2.X4.1-1.

Table A.14.5.2.X4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test parameters are given in Table A.14.5.2.X4.1-2, A.14.5.2.X4.1-3, A.14.5.2.X4.1-4 and A.14.5.2.X3.1-5 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furhtermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time aligment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.14.5.2.X4.1-2: General test parameters

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | | Comment |
| Test1 | Test2 |
| E-UTRA RF Channel Number | |  | 1, 2 | |  |
| Active cell | |  | Cell 1 | |  |
| Neighbour cell | |  | Cell 2 | | Cell to be identified. |
| CP length | |  | Normal | |  |
| DRX | |  | ON | |  |
| A3 | Offset | dB | -6 | |  |
| Hysteresis | dB | 0 | |  |
| Time To Trigger | S | 0 | |  |
| Filter coefficient | |  | 0 | | L3 filtering is not used |
| Gap pattern ID | |  | 0 | |  |
| *Rmax* | |  | 8 | | As defined in *mPDCCH-NumRepetition* in [3] |
| *G* | |  | 1 | | As defined in *mPDCCH-startSF-UESS* in [3] |
| *X* | |  | scheme10 | | As defined in *measGapSharingScheme* in [3] |
| T1 | | S | 5 | |  |
| T2 | | S | 10 | 60 |  |

Table A.14.5.2.X4.1-3: Cell specific test parameters

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configurations | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| Satellite information | |  | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  | 2 | SSC.2 | SSC.2 | NSC.2 | NSC.2 |
| E-UTRA RF Channel Number | |  | 1,2 | 1 | | 2 | |
| BWchannel | | MHz | 1,2 | 1.4 | | 1.4 | |
| PDSCH parameters:  DL Reference Measurement Channel | |  | 1,2 | R.49 HD-FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel | |  | 1,2 | R.47 HD-FDD | | R.47 HD-FDD | |
| OCNG Patterns | |  | 1,2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | | dB | 1,2 | -3 | | -3 | |
| PBCH\_RB | | dB | 1,2 |
| PSS\_RA | | dB | 1,2 |
| SSS\_RA | | dB | 1,2 |
| PCFICH\_RB | | dB | 1,2 |
| PHICH\_RA | | dB | 1,2 |
| PHICH\_RB | | dB | 1,2 |
| MPDCCH\_RA | | dB | 1,2 |
| MPDCCH\_RB | | dB | 1,2 |
| PDSCH\_RA | | dB | 1,2 |
| PDSCH\_RB | | dB | 1,2 |
| OCNG\_RANote 1 | | dB | 1,2 |
| OCNG\_RBNote 1 | | dB | 1,2 |
| Note 2 | | dBm/15 KHz | 1,2 | -98 | | -98 | |
|  | | dB | 1,2 | 4 | 4 | -Infinity | 4 |
| Note 3 | | dB | 1,2 | 4 | 4 | -Infinity | 4 |
| RSRP Note 3 | | dBm/15 KHz | 1,2 | -94 | -94 | -Infinity | -94 |
| SCH\_RP Note 3 | | dBm/15 KHz | 1,2 | -94 | -94 | -Infinity | -94 |
| Io Note 3 | | dBm/9MHz | 1,2 | -64.76 | -64.76 | -Infinity | -64.76 |
| Propagation Condition | |  | 1,2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration | |  | 1,2 | 1X1 | | 1X1 | |
| Timing offset to Cell 1 | | ms | 1,2 | - | | 3 | |
|  | Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | |

Table A.14.5.2.X4.1-4: DRX-Configuration

|  |  |  |  |
| --- | --- | --- | --- |
| Field | Test1 | Test2 | Comment |
| Value | Value |
| onDurationTimer | psf1 | psf1 | As specified in clause 6.3.2 in TS 36.331 |
| drx-InactivityTimer | psf1 | psf1 |
| drx-RetransmissionTimer | psf1 | psf1 |
| longDRX-CycleStartOffset | sf128 | sf1280 |
| shortDRX | disable | disable |

Table A.14.5.2.X4.1-5: *TimeAlignmentTimer* -Configuration

|  |  |  |  |
| --- | --- | --- | --- |
| Field | Test1 | Test2 | Comment |
| Value | Value |
| TimeAlignmentTimer | sf500 | sf500 | As specified in clause 6.3.2 in TS 36.331 |
| sr-ConfigIndex | 0 | 0 | For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213. |

##### A.14.5.2.X4.2 Test Requirement

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6.4 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 51.2 s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the r

#### A.14.5.2.X5 E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN conditions in asynchronous cells for UE category M1 with discontinuous MPDCCH monitoring in CEModeB

##### A.14.5.2.X5.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event with discontinuous MPDCCH monitoring. This test will partly verify the FDD-FDD inter-frequency cell search requirements in clause 8.13A.3.2.1. The supported test configurations are provided in Table A.14.5.2.X5.1-1.

Table A.14.5.2.X5.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test parameters are given in Table A.14.5.2.X5.1-2 and A.14.5.2.X5.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

Table A.14.5.2.X5.1-2: General test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1, 2 |  |
| Active cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified. |
| CP length | |  | Normal |  |
| DRX | |  | OFF |  |
| A3 | Offset | dB | -8 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | S | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 0 |  |
| *Rmax* | |  | 128 | As defined in *mPDCCH-NumRepetition* in [3] |
| *G* | |  | 8 | As defined in *mPDCCH-startSF-UESS* in [3] |
| *X* | |  | scheme01 | As defined in *measGapSharingScheme* in [3] |
| T1 | | S | 5 |  |
| T2 | | S | ≤825 |  |

Table A.14.5.2.X5.1-3: Cell specific test parameters

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configurations** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| Satellite information | |  | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  | 2 | SSC.2 | SSC.2 | NSC.2 | NSC.2 |
| E-UTRA RF Channel Number | |  | 1,2 | 1 | | 2 | |
| BWchannel | | MHz | 1,2 | 1.4 | | 1.4 | |
| PDSCH parameters:  DL Reference Measurement Channel | |  | 1,2 | R.52 FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel | |  | 1,2 | R.50 FDD | | R.50 FDD | |
| OCNG Patterns | |  | 1,2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | | dB | 1,2 | -3 | | -3 | |
| PBCH\_RB | | dB | 1,2 |
| PSS\_RA | | dB | 1,2 |
| SSS\_RA | | dB | 1,2 |
| PCFICH\_RB | | dB | 1,2 |
| PHICH\_RA | | dB | 1,2 |
| PHICH\_RB | | dB | 1,2 |
| MPDCCH\_RA | | dB | 1,2 |
| MPDCCH\_RB | | dB | 1,2 |
| PDSCH\_RA | | dB | 1,2 |
| PDSCH\_RB | | dB | 1,2 |
| OCNG\_RANote 1 | | dB | 1,2 |
| OCNG\_RBNote 1 | | dB | 1,2 |
| Note 2 | | dBm/15 KHz | 1,2 | -98 | | -98 | |
|  | | dB | 1,2 | -12 | -12 | -Infinity | -12 |
| Note 3 | | dB | 1,2 | -12 | -12 | -Infinity | -12 |
| RSRP Note 3 | | dBm/15 KHz | 1,2 | -110 | -110 | -Infinity | -110 |
| SCH\_RP Note 3 | | dBm/15 KHz | 1,2 | -110 | -110 | -Infinity | -110 |
| Io Note 3 | | dBm/9MHz | 1,2 | -69.95 | -69.95 | -Infinity | -69.95 |
| dBm/4.5 MHz | 1,2 | -72.96 | -72.96 | -Infinity | -72.96 |
| Propagation Condition | |  | 1,2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration | |  | 1,2 | 1X1 | | 1X1 | |
| Timing offset to Cell 1 | | ms | 1,2 | - | | 3 | |
|  | Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | |

##### A.14.5.2.X5.2 Test Requirement

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [819.2] s from the beginning of time period T2 which is derived from section 8.13.3.5.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to *pusch-maxNumRepetitionCEmodeB* x TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH, where *pusch-maxNumRepetitionCEmodeB* [2] is the maximum number of PUSCH repetitions configured

#### A.14.5.2.X6 E-UTRAN HD-FDD inter-frequency event triggered reporting under AWGN conditions in asynchronous cells for UE category M1 with discontinuous MPDCCH monitoring in CEModeB

##### A.14.5.2.X6.1 Test Purpose and Environment

The purpose of this test is to verify that the Cat-M1 UE makes correct reporting of an event with discontinuous MPDCCH monitoring. This test will partly verify the HD-FDD inter-frequency cell search requirements in clause 8.13A.3.2.2. The supported test configurations are provided in Table A.14.5.2.X6.1-1.

Table A.14.5.2.X6.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |

The test parameters are given in Table A.14.5.2.X6.1-2 and A.14.5.2.X6.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. At the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, and due to usage of an offset this shall result in reporting of Event A3.

During the test, downlink traffic is continuously scheduled. MPDCCH is not collided with gap.

Table A.14.5.2.X6.1-2: General test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| E-UTRA RF Channel Number | |  | 1, 2 |  |
| Active cell | |  | Cell 1 |  |
| Neighbour cell | |  | Cell 2 | Cell to be identified. |
| CP length | |  | Normal |  |
| DRX | |  | OFF |  |
| A3 | Offset | dB | -8 |  |
| Hysteresis | dB | 0 |  |
| Time To Trigger | S | 0 |  |
| Filter coefficient | |  | 0 | L3 filtering is not used |
| Gap pattern ID | |  | 0 |  |
| *Rmax* | |  | 128 | As defined in *mPDCCH-NumRepetition* in [3] |
| *G* | |  | 8 | As defined in *mPDCCH-startSF-UESS* in [3] |
| *X* | |  | scheme01 | As defined in *measGapSharingScheme* in [3] |
| T1 | | S | 5 |  |
| T2 | | S | ≤825 |  |

Table A.14.5.2.X6.1-3: Cell specific test parameters

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configurations** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| Satellite information | |  | 1 | SSC.1 | SSC.1 | NSC.1 | NSC.1 |
|  | 2 | SSC.2 | SSC.2 | NSC.2 | NSC.2 |
| E-UTRA RF Channel Number | |  | 1,2 | 1 | | 2 | |
| BWchannel | | MHz | 1,2 | 1.4 | | 1.4 | |
| PDSCH parameters:  DL Reference Measurement Channel | |  | 1,2 | R.53 HD-FDD | | - | |
| MPDCCH parameters:  DL Reference Measurement Channel | |  | 1,2 | R.51 HD-FDD | | R.51 HD-FDD | |
| OCNG Patterns | |  | 1,2 | OP.7 FDD | | OP.7 FDD | |
| PBCH\_RA | | dB | 1,2 | -3 | | -3 | |
| PBCH\_RB | | dB | 1,2 |
| PSS\_RA | | dB | 1,2 |
| SSS\_RA | | dB | 1,2 |
| PCFICH\_RB | | dB | 1,2 |
| PHICH\_RA | | dB | 1,2 |
| PHICH\_RB | | dB | 1,2 |
| MPDCCH\_RA | | dB | 1,2 |
| MPDCCH\_RB | | dB | 1,2 |
| PDSCH\_RA | | dB | 1,2 |
| PDSCH\_RB | | dB | 1,2 |
| OCNG\_RANote 1 | | dB | 1,2 |
| OCNG\_RBNote 1 | | dB | 1,2 |
| Note 2 | | dBm/15 KHz | 1,2 | -98 | | -98 | |
|  | | dB | 1,2 | -12 | -12 | -Infinity | -12 |
| Note 3 | | dB | 1,2 | -12 | -12 | -Infinity | -12 |
| RSRP Note 3 | | dBm/15 KHz | 1,2 | -110 | -110 | -Infinity | -110 |
| SCH\_RP Note 3 | | dBm/15 KHz | 1,2 | -110 | -110 | -Infinity | -110 |
| Io Note 3 | | dBm/9MHz | 1,2 | -69.95 | -69.95 | -Infinity | -69.95 |
| dBm/4.5 MHz | 1,2 | -72.96 | -72.96 | -Infinity | -72.96 |
| Propagation Condition | |  | 1,2 | AWGN | | AWGN | |
| Correlation Matrix and Antenna Configuration | |  | 1,2 | 1X1 | | 1X1 | |
| Timing offset to Cell 1 | | ms | 1,2 | - | | 3 | |
|  | Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: Es/Iot, RSRP, SCH\_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. | | | | | | |

##### A.14.5.2.X6.2 Test Requirement

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 819.2 s from the beginning of time period T2 which is derived from section 8.13.3.5.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to *pusch-maxNumRepetitionCEmodeB* x TTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH, where *pusch-maxNumRepetitionCEmodeB* [2] is the maximum number of PUSCH repetitions configured

reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

## <<< NEXT CHANGE >>>

## A.14.6 Measurement performance requirements for UE for satellite access

### A.14.6.1 RSRP for satellite access

#### A.14.6.1.1 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA

##### A.14.6.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.21A.1 and 9.1.21A.2 for FD-FDD intra frequency RSRP measurements for Cat-M1 UE in CEModeA.

##### A.14.6.1.1.2 Test parameters

The supported test configurations are provided in Table A.14.6.1.1.2-2. In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.14.6.1.1.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.14.6.1.1.2-1: FD-FDD RSRP Intra frequency test parameters for Cat-M1 UE in CEModeA

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Test 1** | | **Test 2** | | **Test 3** | |
| **Cell 1** | **Cell 2** | **Cell 1** | **Cell 2** | **Cell 1** | **Cell 2** |
| E-UTRA RF Channel Number | |  | 1, 2 | 1 | | 1 | | 1 | |
| BWchannel | | MHz | 1, 2 | 1.4 | | 1.4 | | 1.4 | |
| Satellite information | |  | 1 | SSC.1 | NSC.3 | SSC.1 | NSC.3 | SSC.1 | NSC.3 |
|  | |  | 2 | SSC.2 | NSC.4 | SSC.2 | NSC.4 | SSC.2 | NSC.4 |
| PDSCH Reference measurement channel | |  | 1, 2 | R.48 FDD | - | R.48 FDD | - | R.48 FDD | - |
| PDSCH allocation | |  | 1, 2 | Follows R.48 FDD | - | Follows R.48 FDD | - | Follows R.48 FDD | - |
| MPDCCH Reference measurement channel | |  | 1, 2 | R.46 FDD | | R.46 FDD | | R.46 FDD | |
| OCNG Patterns | |  | 1, 2 | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | | dB | 1, 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| PBCH\_RB | |  |
| PSS\_RA | |  |
| SSS\_RA | |  |
| PCFICH\_RB | |  |
| PHICH\_RA | |  |
| PHICH\_RB | |  |
| MPDCCH\_RA | |  |
| MPDCCH\_RB | |  |
| PDSCH\_RA | |  |
| PDSCH\_RB | |  |
| OCNG\_RANote1 | |  |
| OCNG\_RBNote1 | |  |
| Note2 | Bands FDD-M1\_SAB\_A, FDD-M1\_SAB\_B | dBm/15 kHz | 1, 2 | -106 | | -86 | | -116 | |
|  | | dB | 1, 2 | 6 | 1 | 6 | 1 | 3 | -1 |
|  | | dB | 1, 2 | 2.5 | -6 | 2.5 | -6 | 0.46 | -5.76 |
| RSRPNote3 | Bands FDD-M1\_SAB\_A, FDD-M1\_SAB\_B | dBm/15 kHz | 1, 2 | -100 | -105 | -80 | -85 | -113 | -117 |
|  | -112.5 | -116.5 |
|  | -112 | -116 |
|  | -111.5 | -115.5 |
|  | -111 | -115 |
|  | -110 | -114 |
|  | -109.5 | -113.5 |
| IoNote3 | FDD-M1\_SAB\_A, FDD-M1\_SAB\_B | dBm/9 MHz | 1, 2 | -70.27 | | -50.27 | | -82.43 | |
|  | -81.93 | |
|  | -81.43 | |
|  | -80.93 | |
|  | -80.43 | |
|  | -79.43 | |
|  | -78.93 | |
| Propagation condition | | - | 1, 2 | AWGN | | AWGN | | AWGN | |
| Antenna Configuration | |  | 1, 2 | 1x1 | | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | | ms | 1, 2 | - | 3 | - | 3 | - | 3 |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: E-UTRA operating band groups are as defined in Section 3.5.  Note 5: For Band 74, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 1475.9-1510.9 MHz. | | | | | | | | | |

Table A.14.6.1.1.2-2: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, FDD-FDD duplex mode |
| 2 | NGSO, FDD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

##### A.14.6.1.1.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.21A.1 and 9.1.21A.2.

#### A.14.6.1.2 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA

##### A.14.6.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.21A.1 and 9.1.21A.2 for HD-FDD intra frequency RSRP measurements for Cat-M1 UE in CEModeA.

##### A.14.6.1.2.2 Test parameters

The supported test configurations are provided in Table A.14.6.1.2.2-2. In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.14.6.1.2.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.14.6.1.2.2-1: HD-FDD RSRP Intra frequency test parameters for Cat-M1 UE in CEModeA

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Test 1** | | **Test 2** | | **Test 3** | |
| **Cell 1** | **Cell 2** | **Cell 1** | **Cell 2** | **Cell 1** | **Cell 2** |
| E-UTRA RF Channel Number | |  | 1, 2 | 1 | | 1 | | 1 | |
| BWchannel | | MHz | 1, 2 | 1.4 | | 1.4 | | 1.4 | |
| Satellite information | |  | 1 | SSC.1 | NSC.1 | SSC.1 | NSC.1 | SSC.1 | NSC.1 |
|  | |  | 2 | SSC.2 | NSC.2 | SSC.2 | NSC.2 | SSC.2 | NSC.2 |
| PDSCH Reference measurement channel | |  | 1, 2 | R.49 HD-FDD | - | R.49 HD-FDD | - | R.49 HD-FDD | - |
| PDSCH allocation | |  | 1, 2 | Follows R.49 HD-FDD | - | Follows R.49 HD-FDD | - | Follows R.49 HD-FDD | - |
| MPDCCH Reference measurement channel | |  | 1, 2 | R.47 HD-FDD | | R.47 HD-FDD | | R.47 HD-FDD | |
| OCNG Patterns | |  | 1, 2 | OP.21 FDD | OP.6 FDD | OP.21 FDD | OP.6 FDD | OP.21 FDD | OP.6 FDD |
| PBCH\_RA | | dB | 1, 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| PBCH\_RB | |  |
| PSS\_RA | |  |
| SSS\_RA | |  |
| PCFICH\_RB | |  |
| PHICH\_RA | |  |
| PHICH\_RB | |  |
| MPDCCH\_RA | |  |
| MPDCCH\_RB | |  |
| PDSCH\_RA | |  |
| PDSCH\_RB | |  |
| OCNG\_RANote1 | |  |
| OCNG\_RBNote1 | |  |
| Note2 | Bands FDD-M1\_SAB\_A, FDD-M1\_SAB\_B | dBm/15 kHz | 1, 2 | -106 | | -86 | | -116 | |
|  | -115.5 | |
|  | -115 | |
|  | -114.5 | |
|  | -114 | |
|  | -113 | |
|  | -112.5 | |
|  | | dB | 1, 2 | 6 | 1 | 6 | 1 | 3 | -1 |
| Note3 | | dB | 1, 2 | 2.5 | -6 | 2.5 | -6 | 0.46 | -5.76 |
| RSRPNote3 | Bands FDD-M1\_SAB\_A, FDD-M1\_SAB\_B | dBm/15 kHz | 1, 2 | -100 | -105 | -80 | -85 | -113 | -117 |
|  | -112.5 | -116.5 |
|  | -112 | -116 |
|  | -111.5 | -115.5 |
|  | -111 | -115 |
|  | -110 | -114 |
|  | -109.5 | -113.5 |
| IoNote3 | Bands FDD-M1\_A | dBm/9 MHz | 1, 2 | -70.27 | | -50.27 | | -82.43 | |
| Bands FDD-M1\_B |  | -81.93 | |
| Bands FDD-M1\_C |  | -81.43 | |
| Bands FDD-M1\_D |  | -80.93 | |
| Bands FDD-M1\_E, FDD-M1\_F Note 4 |  | -80.43 | |
| Bands FDD-M1\_G |  | -79.43 | |
| Bands FDD-M1\_H |  | -78.93 | |
| Propagation condition | | - | 1, 2 | AWGN | | AWGN | | AWGN | |
| Antenna Configuration | |  | 1, 2 | 1x1 | | 1x1 | | 1x1 | |
| Timing offset to Cell 1 | | ms | 1, 2 | - | 3 | - | 3 | - | 3 |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: E-UTRA operating band groups are as defined in Section 3.5. | | | | | | | | | |

Table A.14.6.1.2.2-2: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | GSO, HD-FDD duplex mode |
| 2 | NGSO, HD-FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: Config 2 is applicable when SIB33 is provided to the UE. | |

##### A.14.6.1.2.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.21A.1 and 9.1.21A.2.

## <<< NEXT CHANGE >>>

#### A.14.6.1.3 FD-FDD RSRP Inter frequency case for Cat-M1 UE in CEModeA

##### A.14.6.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.21A.9 and 9.1.21A.10 for FD-FDD inter frequency RSRP measurements for Cat-M1 UE in CEModeA.

##### A.14.6.1.3.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP inter frequency measurements are tested by using the parameters in Table A.14.6.1.3.2-1 and Table A.14.6.1.3.2-2. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.14.6.1.3.2-1: Supported test configurations

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, FD-FDD duplex mode |
| 2 | NGSO, FD-FDD duplex mode |
| Note: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2. | |

Table A.14.6.1.3.2-2: FD-FDD RSRP Inter frequency test parameters for Cat-M1 UE in CEModeA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | | Unit | Test 1 | | Test 2 | |
| Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| Satellite information | | Config 1 |  | SSC.1 | NSC.1 | SSC.1 | NSC.1 |
| Config 2 |  | SSC.2 | NSC.2 | SSC.2 | NSC.2 |
| E-UTRA RF Channel Number | | |  | 1 | 2 | 1 | 2 |
| BWchannel | | | MHz | 1.4 | 1.4 | 1.4 | 1.4 |
| Gap Pattern Id | | |  | 0 | - | 0 | - |
| PDSCH Reference measurement channel | | |  | R.48 FDD | - | R.48 FDD | - |
| PDSCH allocation | | |  | Follows  R.48 FDD | - | Follows  R.48 FDD | - |
| MPDCCH Reference measurement channel | | |  | R.46 FDD | R.46 FDD | R.46 FDD | R.46 FDD |
| OCNG Patterns | | |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | | | dB | 0 | 0 | 0 | 0 |
| PBCH\_RB | | |
| PSS\_RA | | |
| SSS\_RA | | |
| PCFICH\_RB | | |
| PHICH\_RA | | |
| PHICH\_RB | | |
| MPDCCH\_RA | | |
| MPDCCH\_RB | | |
| PDSCH\_RA | | |
| PDSCH\_RB | | |
| OCNG\_RANote1 | | |
| OCNG\_RBNote1 | | |
| Note2 | FDD-M1\_SAB\_A | | dBm/15 kHz | -88.65 | -88.65 | ( for Channel 2 +8dB) | -116 |
| FDD-M1\_SAB\_B | | -115.5 |
|  | | | dB | 10 | 10 | 13 | -4 |
| RSRPNote3 | FDD-M1\_SAB\_A | | dBm/15 kHz | -78.65 | -78.65 | (RSRP for Cell 2 +25dB) | -120 |
| FDD-M1\_SAB\_B | | -119.5 |
| IoNote3 | FDD-M1\_SAB\_A | | dBm/9 MHz | -50.45 | -50.45 | (Io for Channel 2 +19.75dB) | -86.76 |
| FDD-M1\_SAB\_B | | -86.26 |
|  | | | dB | 10 | 10 | 13 | -4 |
| Propagation condition | | | - | AWGN | AWGN | AWGN | AWGN |
| Antenna Configuration | | |  | 1x1 | 1x1 | 1x1 | 1x1 |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Void  Note 5: E-UTRA operating band groups are as defined in Section 3.5. | | | | | | | |

##### A.14.6.1.3.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.21A.9 and 9.1.21A.10.

#### A.14.6.1.4 HD-FDD RSRP Inter frequency case for Cat-M1 UE in CEModeA

##### A.14.6.1.4.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.21A.9 and 9.1.21A.10 for HD-FDD inter frequency RSRP measurements for Cat-M1 UE in CEModeA.

##### A.14.6.1.4.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP inter frequency measurements are tested by using the parameters in Table A.14.6.1.4.2-1. In all test cases, Cell 1 is the PCell and Cell 2 the target cell.

Table A.14.6.1.4.2-1: HD-FDD RSRP Inter frequency test parameters for Cat-M1 UE in CEModeA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test 1 | | Test 2 | |
| Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| Satellite information | Config 1 |  | SSC.1 | NSC.1 | SSC.1 | NSC.1 |
| Config 2 |  | SSC.2 | NSC.2 | SSC.2 | NSC.2 |
| E-UTRA RF Channel Number | |  | 1 | 2 | 1 | 2 |
| BWchannel | | MHz | 1.4 | 1.4 | 1.4 | 1.4 |
| Gap Pattern Id | |  | 0 | - | 0 | - |
| PDSCH Reference measurement channel | |  | R.49 HD-FDD | - | R.49 HD-FDD | - |
| PDSCH allocation | |  | Follows R.49 HD-FDD | - | Follows R.49 HD-FDD | - |
| MPDCCH Reference measurement channel | |  | R.47 HD-FDD | R.47 HD-FDD | R.47 HD-FDD | R.47 HD-FDD |
| OCNG Patterns | |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | | dB | 0 | 0 | 0 | 0 |
| PBCH\_RB | |
| PSS\_RA | |
| SSS\_RA | |
| PCFICH\_RB | |
| PHICH\_RA | |
| PHICH\_RB | |
| MPDCCH\_RA | |
| MPDCCH\_RB | |
| PDSCH\_RA | |
| PDSCH\_RB | |
| OCNG\_RANote1 | |
| OCNG\_RBNote1 | |
| Note2 | FDD-M1\_SAB\_A | dBm/15 kHz | -88.65 | -88.65 | ( for Channel 2 +8dB) | -116 |
| FDD-M1\_SAB\_B | -115.5 |
|  | | dB | 10 | 10 | 13 | -4 |
| RSRPNote3 | FDD-M1\_SAB\_A | dBm/15 kHz | -78.65 | -78.65 | (RSRP for Cell 2 +25dB) | -120 |
| FDD-M1\_SAB\_B | -119.5 |
| IoNote3 | FDD-M1\_SAB\_A | dBm/9 MHz | -50.45 | -50.45 | (Io for Channel 2 +19.75dB) | -86.76 |
| FDD-M1\_SAB\_B | -86.26 |
|  | | dB | 10 | 10 | 13 | -4 |
| Propagation condition | | - | AWGN | AWGN | AWGN | AWGN |
| Antenna Configuration | |  | 1x1 | 1x1 | 1x1 | 1x1 |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Void  Note 5: E-UTRA operating band groups are as defined in Section 3.5. | | | | | | |

##### A.14.6.1.4.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.21A.9 and 9.1.21A.10.

#### A.14.6.1.5 FD-FDD RSRP Inter frequency case for Cat-M1 UE in CEModeB

##### A.14.6.1.5.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.21A.11 and 9.1.21A.12 for FD-FDD intra frequency RSRP measurements for Cat-M1 UE in CEModeB.

##### A.14.6.1.5.2 Test parameters

Both absolute and relative accuracy of RSRP inter frequency measurements are tested by using the parameters in Table A.14.6.1.5.2-1 and A.14.6.1.5.2-2. In all test cases, Cell 1 is the PCell and Cell 2 the target cell. All the tests contain MPDCCH for UL grant for reporting RSRP.

Table A.14.6.1.5.2-1: FD-FDD RSRP Inter frequency test parameters for Cat-M1 UE in CEModeB for 1.4 MHz cell BW

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test 1** | | **Test 2** | |
| **Cell 1** | **Cell 2** | **Cell 1** | **Cell 2** |
| Satellite information | Config 1 |  | SSC.1 | NSC.1 | SSC.1 | NSC.1 |
| Config 2 |  | SSC.2 | NSC.2 | SSC.2 | NSC.2 |
| E-UTRA RF Channel Number | |  | 1 | 2 | 1 | 2 |
| BWchannel | | MHz | 1.4 | 1.4 | 1.4 | 1.4 |
| Gap Pattern Id | |  | 0 | - | 0 | - |
| PDSCH Reference measurement channel | |  | R.52 FDD | - | R.52 FDD | - |
| PDSCH allocation | |  | Follows R.52 FDD | - | Follows R.52 FDD | - |
| MPDCCH Reference measurement channel | |  | R.50 FDD | R.50 FDD | R.50 FDD | R.50 FDD |
| OCNG Patterns | |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | | dB | 0 | 0 | 0 | 0 |
| PBCH\_RB | |
| PSS\_RA | |
| SSS\_RA | |
| PCFICH\_RB | |
| PHICH\_RA | |
| PHICH\_RB | |
| MPDCCH\_RA | |
| MPDCCH\_RB | |
| PDSCH\_RA | |
| PDSCH\_RB | |
| OCNG\_RANote1 | |
| OCNG\_RBNote1 | |
| Note2 | FDD-M1\_SAB\_A | dBm/15 kHz | -78.5 | -78.5 | -98.5 | -108 |
| FDD-M1\_SAB\_B | -107.5 |
|  | | dB | -12 | -12 | -12 | -12 |
| RSRPNote3 | FDD-M1\_SAB\_A | dBm/15 kHz | -90.5 | -90.5 | -110.5 | -120 |
| FDD-M1\_SAB\_B | -119.5 |
| IoNote3 | FDD-M1\_SAB\_A | dBm/9 MHz | -50.45 | -50.45 | -70.45 | -86.76 |
| FDD-M1\_SAB\_B | -86.26 |
|  | | dB | -12 | -12 | -12 | -12 |
| Propagation condition | | - | AWGN | AWGN | AWGN | AWGN |
| Antenna Configuration | |  | 1x1 | 1x1 | 1x1 | 1x1 |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Void  Note 5: E-UTRA operating band groups are as defined in Section 3.5. | | | | | | |

##### A.14.6.1.5.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.21A.11 and 9.1.21A.12.

#### A.14.6.1.6 HD-FDD RSRP Inter frequency case for Cat-M1 UE in CEModeB

##### A.14.6.1.6.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Sections 9.1.21A.11 and 9.1.21A.12 for HD-FDD inter frequency RSRP measurements for Cat-M1 UE in CEModeB.

##### A.14.6.1.6.2 Test parameters

Both absolute and relative accuracy of RSRP inter frequency measurements are tested by using the parameters in Table A.14.6.1.6.2-1 and A.14.6.1.6.2-2. In all test cases, Cell 1 is the PCell and Cell 2 the target cell. All the tests contain MPDCCH for UL grant for reporting RSRP.

Table A.14.6.1.6.2-1: HD-FDD RSRP Inter frequency test parameters for Cat-M1 UE in CEModeB for 1.4 Mhz Cell BW

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test 1** | | **Test 2** | |
| **Cell 1** | **Cell 2** | **Cell 1** | **Cell 2** |
| Satellite information | Config 1 |  | SSC.1 | NSC.1 | SSC.1 | NSC.1 |
| Config 2 |  | SSC.2 | NSC.2 | SSC.2 | NSC.2 |
| E-UTRA RF Channel Number | |  | 1 | 2 | 1 | 2 |
| BWchannel | | MHz | 1.4 | 1.4 | 1.4 | 1.4 |
| Gap Pattern Id | |  | 0 | - | 0 | - |
| PDSCH Reference measurement channel | |  | R.53 HD-FDD | - | R.53 HD-FDD | - |
| PDSCH allocation | |  | Follows R.53 HD-FDD | - | Follows R.53 HD-FDD | - |
| MPDCCH Reference measurement channel | |  | R.51 HD-FDD | R.51 HD-FDD | R.51 HD-FDD | R.51 HD-FDD |
| OCNG Patterns | |  | OP.7 FDD | OP.7 FDD | OP.7 FDD | OP.7 FDD |
| PBCH\_RA | | dB | 0 | 0 | 0 | 0 |
| PBCH\_RB | |
| PSS\_RA | |
| SSS\_RA | |
| PCFICH\_RB | |
| PHICH\_RA | |
| PHICH\_RB | |
| MPDCCH\_RA | |
| MPDCCH\_RB | |
| PDSCH\_RA | |
| PDSCH\_RB | |
| OCNG\_RANote1 | |
| OCNG\_RBNote1 | |
| Note2 | FDD-M1\_SAB\_A | dBm/15 kHz | -78.5 | -78.5 | -98.5 | -108 |
| FDD-M1\_SAB\_B | -107.5 |
|  | | dB | -12 | -12 | -12 | -12 |
| RSRPNote3 | FDD-M1\_SAB\_A | dBm/15 kHz | -90.5 | -90.5 | -110.5 | -120 |
| FDD-M1\_SAB\_B | -119.5 |
| IoNote3 | FDD-M1\_SAB\_A | dBm/9 MHz | -50.45 | -50.45 | -70.45 | -86.76 |
| FDD-M1\_SAB\_B | -86.26 |
|  | | dB | -12 | -12 | -12 | -12 |
| Propagation condition | | - | AWGN | AWGN | AWGN | AWGN |
| Antenna Configuration | |  | 1x1 | 1x1 | 1x1 | 1x1 |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Void  Note 5: E-UTRA operating band groups are as defined in Section 3.5. | | | | | | |

##### A.14.6.1.6.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in sections 9.1.21A.11 and 9.1.21A.12.

## <<< NEXT CHANGE >>>

## B.1.11 Conditions for measurements of inter-frequency NB-IoT cells for cell re-selection for UE Category NB1 for satellite access

This clause defines the NB-IoT inter-frequency NRSRP, NRSRP Ês/Iot, NSCH\_RP and NSCH Ês/Iot applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix B.1.11 is defined in Section 3.6.

The conditions for measurements of intra-frequency NB-IoT cells in normal coverage for cell re-selection defined in Table B.1.10-1 also apply for inter-frequency NB-IoT cells in normal coverage in this section.

The conditions for measurements of intra-frequency NB-IoT cells in enhanced coverage for cell re-selection defined in Table B.1.10-2 also apply for inter-frequency NB-IoT cells in enhanced coverage in this section.

## B.1.12 Conditions for measurements of inter-frequency E-UTRAN cells for cell re-selection for UE Category M1 for satellite access

This clause defines the E-UTRAN inter-frequency RSRP, RSRP Ês/Iot, SCH\_RP and SCH Ês/Iot applicable for a corresponding operating band. The UE category M1 applicability of the conditions in Appendix B.1.12 is defined in Section 3.1.

The conditions for normal coverage measurements of FDD and TDD intra-frequency E-UTRAN cells for cell re-selection defined in Table B.1.9-1 and for E-UTRAN HD-FDD defined in Table B.1.9-2 also apply for E-UTRAN FDD, TDD and HD-FDD inter-frequency E-UTRAN cells for cell reselection.

The conditions for enhanced coverage measurements of FDD and TDD intra-frequency E-UTRAN cells for cell re-selection defined in Table B.1.9-3 and for E-UTRAN HD-FDD defined in Table B.1.9-4 also apply for E-UTRAN FDD, TDD, and HD-FDD inter-frequency E-UTRAN cells for re-selection.

## <<< NEXT CHANGE >>>

## B.2.28 Conditions for E-UTRAN inter-frequency measurements by UE Category M1 for satellite access

This clause defines the E-UTRAN inter-frequency SCH\_RP and SCH Ês/Iot applicable for a corresponding operating band. The UE category M1 applicability of the conditions in Appendix B.2.28 is defined in Section 3.1.

The conditions for CE mode A inter-frequency E-UTRAN FDD measurements are defined in Table B.2.28-1 and for E-UTRAN HD-FDD measurements are defined in Table B.2.28-2.

The conditions for CE mode B for inter-frequency E-UTRAN FDD measurements are defined in Table B.2.28-3 and for E-UTRAN HD-FDD measurements are defined in Table B.2.28-4.

Table B.2.28-1: E-UTRAN inter-frequency measurements for FDD for CEModeA for satellite access

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | E-UTRA operating band groupsNote 1 | Minimum SCH\_RP | SCH Ês/Iot |
|  |  | dBm/15kHz | dB |
| Conditions | FDD-M1\_SAB\_A, FDD-M1\_SAB\_B | -127 | ≥ -6 |
| NOTE 1: E-UTRA operating band groups for satellite access are defined in Section 3.5.1A. | | | |

Table B.2.28-2: E-UTRAN inter-frequency measurements for HD-FDD for CEModeA for satellite access

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | E-UTRA operating band groupsNote 1 | Minimum SCH\_RP | SCH Ês/Iot |
|  |  | dBm/15kHz | dB |
| Conditions | FDD-M1\_SAB\_A, FDD-M1\_SAB\_B | -127 | ≥ -6 |
| NOTE 1: E-UTRA operating band groups for satellite access are defined in Section 3.5.1A. | | | |

Table B.2.28-3: E-UTRAN inter-frequency measurements for FDD for CEModeB for satellite access

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | E-UTRA operating band groupsNote 1 | Minimum SCH\_RP | SCH Ês/Iot |
|  |  | dBm/15kHz | dB |
| Conditions | FDD-M1\_SAB\_A, FDD-M1\_SAB\_B | -136 | ≥ -15 |
| NOTE 1: E-UTRA operating band groups for satellite access are defined in Section 3.5.1A. | | | |

Table B.2.28-4: E-UTRAN inter-frequency measurements for HD-FDD for CEModeB for satellite access

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | E-UTRA operating band groupsNote 1 | Minimum SCH\_RP | SCH Ês/Iot |
|  |  | dBm/15kHz | dB |
| Conditions | FDD-M1\_SAB\_A, FDD-M1\_SAB\_B | -136 | ≥ -15 |
| NOTE 1: E-UTRA operating band groups for satellite access are defined in Section 3.5.1A. | | | |

## B.2.29 Conditions for intra-frequency neighbour cell measurements of NB-IoT cells for UE Category NB1 for satellite access

This clause defines the NB-IoT intra-frequency NRSRP, NRSRP Ês/Iot, NSCH\_RP and NSCH Ês/Iot applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix B.2.29 is defined in Section 3.6.

The conditions for measurements of intra-frequency NB-IoT cells in normal coverage are defined in Table B.2.29-1 and B.2.29-2.

Table B.2.29-1: NB-IoT intra-frequency measurements for HD-FDD in normal coverage

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | E-UTRA/NR operating band groups Note 1 | Minimum NRSRP | Minimum NSCH\_RP | NRS Ês/Iot | NSCH Ês/Iot |
| dBm/15kHz | dBm/15kHz | dB | dB |
| Conditions | NFDD\_SAB\_G | -129 | -129 | ≥ -6 | ≥ -6 |
| NOTE 1: E-UTRA/NR operating band groups are as defined in Section 3.5.1A. | | | | | |

## B.2.30 Conditions for inter-frequency neighbour cell measurements of NB-IoT cells for UE Category NB1 for satellite access

This clause defines the NB-IoT inter-frequency NRSRP, NRSRP Ês/Iot, NSCH\_RP and NSCH Ês/Iot applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix B.2.30 is defined in Section 3.6.

The conditions for measurements of intra-frequency NB-IoT cells in normal coverage for cell re-selection defined in Table B.2.29-1 and B.2.29-2 also apply for inter-frequency NB-IoT cells in normal coverage in this section.

### <End of Change>