**3GPP TSG-RAN4 Meeting #111R4-2410375**

Fukuoka, Japan, May 20th – 24th, 2024

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **4597** | **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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Big CR to TS 38.133 on performance requirements for R18 NR and MR-DC measurement gaps and measurements without gaps | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | MediaTek, Intel | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_MG\_enh2-Perf | | | | |  | ***Date:*** | | | 2024-05-13 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Include all endorsed Draft CRs for TS 38.133 under AI 6.5 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The changes from meeting #110bis are:   * Change: cover the test cases of ‘SA event triggered reporting tests for concurrent gap with Pre-MG’ for **FR1**:   + [R4-2405904] Con-Pre-MG TC1: Event triggered reporting test on intra-frequency and inter-frequency in **FR1** with concurrent gap and autonomous activation/deactivation of Pre-MG + Type-2.   + [R4-2406491] Con-Pre-MG TC4: Event triggered reporting test on intra-frequency in FR1 with concurrent gap with Pre-MG and network-controlled activation/deactivation of two Pre-MG for **FR1**. * Change: cover the test cases of ‘SA event triggered reporting tests for concurrent gap with NCSG’ for **FR1**:   + [R4-2406437] Con-NCSG TC1: Event triggered reporting test on inter-frequency in **FR1** with Type-2 + NCSG.   + [R4-2406438] Con-NCSG TC3: Event triggered reporting test on inter-frequency in **FR1** with concurrent gap and NCSG of two NCSGs. * Change: cover the test cases of ‘SA event triggered reporting tests for concurrent gap with Pre-MG’ for **FR2**:   + [R4-2406421] Con-Pre-MG TC2: Event triggered reporting test on intra-frequency and inter-frequency in **FR2** with concurrent gap and network-controlled activation/deactivation of Pre-MG + Type-2.   + [R4-2406499] Con-Pre-MG TC3: Event triggered reporting test on intra-frequency in FR2 with concurrent gap with Pre-MG and autonomous activation/deactivation of two Pre-MG for **FR2**. * Change: cover the test cases of ‘SA event triggered reporting tests for concurrent gap with NCSG’ for **FR2**:   + [R4-2404395] Con-NCSG TC2: Event triggered reporting test on intra-frequency in **FR2** with Type-2 + NCSG.   The changes from meeting #111 are captured in draft CRs: R4-2410419, R4-2407514, R4-24081682, R4-2409253, R4-2410373, R4-2407515, R4-2410332, R4-2410427, R4-2410334, R4-2410335, R4-2408434, R4-2410337, R4-2410338, R4-2410339, R4-2409255, R4-2409256, R4-2409747 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | There will be incomplete and missing test cases in TS 38.133 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | Added a new sub-clause A.6.6.x1, A.6.6.x2, A.7.6.x1, A.7.6.x2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.533 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**----------------------START OF CHANGE 1----------------------------**

### A.6.6.x1 SA event triggered reporting tests for concurrent measurement gaps with Pre-MG

#### A.6.6.x1.1 SA event triggered reporting tests for FR1 concurrent gap with Pre-MG with partially partial overalpping scenario for SSB-based measurements in both intra-frequency and inter-frequency layers

##### A.6.6.x1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the concurrent gap with Pre-MG capable UE makes correct reporting of events. This test will partly verify the SA intra-frequency and inter-frequency NR cell search requirements in clauses 9.2.6 and 9.3.4, respectively. Also, this test will also jointly verify pre-configured measurement gap activation/deactivation delay in clause 8.19.2.

In this test, there are three cells: NR cell 1 as PCell in FR1 on NR RF channel 1, NR cell 2 as neighbour cell in FR1 on NR RF channel 2, and NR cell 3 as neighbour cell in FR1 on the same frequency as the PCell. There are two BWPs configured in Cell 1, BWP-1 which contains the cell defining SSB, and BWP-2 which does not contain any SSB of Cell 1. The test parameters are given in Tables A.6.6.x1.1.1-1, A.6.6.x1.1.1-2 and A.6.6.x1.1.1-3. The TE schedules continuous DL data on PCell throughout the test.

The test consists of four successive time periods, with time durations of T1, T2 and T3 respectively.

During the duration of T1,

- For cell 1, the UE is configured with 2 different UE-specific bandwidth parts for Cell 1 (PCell), BWP-1 and BWP-2, before starting the test.

- BWP-1 includes bandwidth of the initial DL BWP and SSB. UE is expected to deactivate the Pre-MG when this BWP is active.

- BWP-2 does not include bandwidth of the initial DL BWP and SSB. UE is expected to activate the Pre-MG when this BWP is active.

- UE is indicated in *firstActiveDownlinkBWP-Id* that the active DL BWPis BWP-1 in PCell.

At the start of time duration T2, the UE may not have any timing information of neighbor cell to be measured (cell 2) and UE was expected to complete the measurements of SSBs with within T2.

At the start of time duration T3, the serving gNB can trigger Pre-MG activation starts when a DCI format 1\_1 command for PCell DL BWP switch, sent from the test equipment to the UE, is received at the UE side in PCell’s slot # denoted i. The UE shall switch its bandwidth part from BWP-1 to BWP-2. And UE is expected to complete the Pre-MG activation within T3.

At the start of time duration T4, the UE may not have any timing information of neighbor cell to be measured (cell 3). And UE was expected to complete the measurements of SSBs with the activated Pre-MG within T4.

Two measurement gap patterns (MeasGapId #1 and MeasGapId #2 (Pre-MG)) are configured with the gap pattern ID #0 and #1 as defined in Table A.6.6.x1.1.1-2. MeasGapId #2 is configured with a higher priority than MeasGapId #1. MeasGapId #1 and MeasGapId #2 are associated with the MOs for RF channel numbers #2 and #1, respectively.

Table A.6.6.x1.1.1-1: SA event triggered reporting tests for FR1-FR1

|  |  |
| --- | --- |
| Config | Description |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations  Note 2: Target NR cells have the same SCS, BW and duplex mode as NR serving cells | |

Table A.6.6.x1.1.1-2: General test parameters for SA intra-frequency and inter-frequency event triggered reporting for FR1 concurrent gap with Pre-MG with partially partial overalpping scenario for SSB-based measurements in both intra-frequency and inter-frequency layers

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
|  |  |  |  |
| NR RF Channel Number |  | Config 1,2,3 | 1, 2 | Three FR1 NR carrier frequencies are used. |
| Active cell |  | Config 1,2,3 | NR cell 1 (Pcell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2,3 | NR cells 2 and 3 | NR cell 2 is on NR RF channel number 2. NR cell 3 is on the same NR RF channel as NR Cell 1 (NR RF channel 1). |
| Gap Pattern Id |  | Config 1,2,3 | 0 for MeasGapId #1  1 for MeasGapId #2 | As specified in clause 9.1.2-1. |
| Measurement gap offset | ms | Config 1,2,3 | 4 for MeasGapId #1  79 for MeasGapId #2 |  |
| A3-Offset | dB | Config 1,2,3 | -6 |  |
| Hysteresis | dB | Config 1,2,3 | 0 |  |
| CP length |  | Config 1,2,3 | Normal |  |
| TimeToTrigger | s | Config 1,2,3 | 0 |  |
| Filter coefficient |  | Config 1,2,3 | 0 | L3 filtering is not used |
| DRX |  | Config 1,2,3 | OFF | DRX is not used |
| Time offset between serving and neighbour cell |  | Config 1, 2, 3 | 3μs | The timing of Cell 3 is 3μs later than the timing of Cell 1. |
|  | Config 1, 2, 3 | 5ms | The timing of Cell 2 is 5ms later than the timing of Cell 1. |
| T1 | ms | Config 1,2,3 | 100 |  |
| T2 | s | Config 1,2,3 | 1 |  |
| T3 | ms | Config 1,2,3 | 50 |  |
| T4 | s | Config 1,2,3 | 1.5 |  |

Table A.6.6.x1.1.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 concurrent gap with Pre-MG with partially-partial overalpping scenario for SSB-based measurements in both inter-frequency layers

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | Cell 2 | | | Cell 3 | | |
|  |  |  | T1  T2 | T3  T4 | T1 | T2/T3/T4 | | T1/T2/T3 | | T4 |
| NR RF Channel Number |  | Config 1,2,3 | 1 | | 2 | | | 3 | | |
| Duplex mode |  | Config 1 | FDD | | | | | | | |
|  |  | Config 2,3 | TDD | | | | | | | |
| TDD configuration |  | Config 1 | Not Applicable | | | | | | | |
|  |  | Config 2 | TDDConf.1.1 | | | | | | | |
|  |  | Config 3 | TDDConf.2.1 | | | | | | | |
| BWchannel | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | | | |
|  |  | Config 3 | 40: NRB,c = 106 | | | | | | | |
| BWP BW | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | | | |
|  |  | Config 3 | 40: NRB,c = 106 | | | | | | | |
| Initial BWP  Configuration |  | Config 1, 2, 3 | DLBWP.0.1  ULBWP.0.1 | | NA | | | NA | | |
| BWP-1 Configuration |  | Config 1, 2, 3 | DLBWP.1.3  ULBWP.1.3 | | NA | | | NA | | |
| BWP-2 Configuration |  | Config 1, 2, 3 | DLBWP.1.2  ULBWP.1.2 | | NA | | | NA | | |
| TRS configuration |  | Config 1 | TRS.1.1 FDD | | NA | | | NA | | |
|  |  | Config 2 | TRS.1.1 TDD | | NA | | | NA | | |
|  |  | Config 3 | TRS.1.2 TDD | | NA | | | NA | | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) |  | Config 1,2,3 | OP.1 | | OP.1 | | | OP.1 | | |
| PDSCH Reference measurement channel |  | Config 1 | SR.1.1 FDD | |  | | |  | | |
|  |  | Config 2 | SR.1.1 TDD | |  | | |  | | |
|  |  | Config 3 | SR.2.1 TDD | |  | | |  | | |
| RMSI CORESET Reference Channel |  | Config 1 | CR.1.1 FDD | |  | | |  | | |
|  |  | Config 2 | CR.1.1 TDD | |  | | |  | | |
|  |  | Config 3 | CR.2.1 TDD | |  | | |  | | |
| Dedicated CORESET Reference Channel |  | Config 1 | CCR.1.1 FDD | |  | | |  | | |
|  | Config 2 | CCR.1.1 TDD | |  | | |  | | |
|  | Config 3 | CCR.2.1 TDD | |  | | |  | | |
| SSB parameters |  | Config 1,2 | SSB.1 FR1 | | | | | | | |
| Config 3 | SSB.2 FR1 | | | | | | | |
| SMTC configuration defined in A.3.11 |  | Config 1,2,3 | SMTC.2 | | SMTC.7 | | | SMTC.2 | | |
| PDSCH/PDCCH subcarrier spacing | kHz | Config 1,2 | 15 | | | | | | | |
|  |  | Config 3 | 30 | | | | | | | |
| EPRE ratio of PSS to SSS |  | Config 1,2,3 | 0 | | 0 | | | 0 | | |
| EPRE ratio of PBCH DMRS to SSS |  |  |  | |  | | |  | | |
| EPRE ratio of PBCH to PBCH DMRS |  |  |  | |  | | |  | | |
| EPRE ratio of PDCCH DMRS to SSS |  |  |  | |  | | |  | | |
| EPRE ratio of PDCCH to PDCCH DMRS |  |  |  | |  | | |  | | |
| EPRE ratio of PDSCH DMRS to SSS |  |  |  | |  | | |  | | |
| EPRE ratio of PDSCH to PDSCH |  |  |  | |  | | |  | | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) |  |  |  | |  | | |  | | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) |  |  |  | |  | | |  | | |
| Note2 | dBm/15kHz |  | -98 | | -98 | | | -98 | | |
| Note2 | dBm/SCS | Config 1,2 | -98 | | -98 | | | -98 | | |
|  |  | Config 3 | -95 | | -95 | | | -95 | | |
| SS-RSRP Note 3 | dBm/SCS | Config 1,2 | -94 | -94 | -Infinity | | -91 | -Infinity | -94 | |
|  |  | Config 3 | -91 | -91 | -Infinity | | -88 | -Infinity | -91 | |
|  | dB | Config 1,2,3 | 4 | -1.46 | -Infinity | | 7 | -Infinity | -1.46 | |
|  | dB | Config 1,2,3 | 4 | 4 | -Infinity | | 7 | -Infinity | 4 | |
| IoNote3 | dBm/9.36MHz | Config 1,2 | -64.59 | -62.25 | -70.05 | | -62.26 | -64.59 | -62.25 | |
|  | dBm/38.16MHz | Config 3 | -58.49 | -56.16 | -63.94 | | -56.15 | -58.49 | -56.16 | |
| Propagation Condition |  | Config 1,2,3 | AWGN | | AWGN | | | AWGN | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | | | | |

##### A.6.6.x1.1.2 Test Requirements

During T1, T2, and T3, the UE shall report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with the Pre-MG occasions, starting from the 1st complete Pre-MG occasion after the beginning of PCell’s DL slot (*i+TBWPswitchDelay*) + 5ms as defined in clause 8.19.2.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [800] ms for cell 2 from the beginning of time period T2.

The UE shall send one Event A3 triggered measurement report for each neighboring cell, with a measurement reporting delay less than [1280] ms for cell 3 from the beginning of time period T4.

During T4, the UE shall NOT be able to receive PDSCH and report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with the non-dropped activated Pre-MG occasions (MeasGapId #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%. UE is not required to report SSB time index.

NOTE 1: 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.

NOTE 2: the UE shall NOT be able to receive PDSCH and report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with concurrent MG (MeasGapId #1) occasions.

#### A.6.6.x1.2 SA event triggered reporting tests for concurrent gap with pre-configured gaps and network-controlled activation/deactivation

##### A.6.6.x1.2.1 Test purpose and Environment

The purpose of this test is to verify that the UE correctly activates and deactivates the pre-MGs and makes correct measurement and reporting of an event with activated and deactivated pre-MG. This test will partly verify the multiple Pre-MG activation/deactivation delay in clause 8.19.5.2 and the intra-frequency cell search requirements in clause 9.2.6.2 and 9.2.6.3.

##### A.6.6.x1.2.2 Test parameters

Three cells are deployed in the test, which are FR1 PCell (Cell 1) in FR1 on NR RF channel 1 and a neighbour cell (Cell 2) in FR1 on NR RF channel 1 and a neighbour cell (Cell 3) in FR1 on NR RF channel 2. The supported test configurations are listed in Table A.6.6.x1.2.2-1, general test parameters are listed in Table A.6.6.x1.2.2-2, and cell specific test parameters are listed in Table A.6.6.x1.2.2-3.

Two Pre-MG gaps (MeasGapId #1 and MeasGapId #2) are configured with the Pre-MG gap pattern ID #0 and #1 as defined in Table A.6.6.x1.2.2-2. MeasGapId #2 is configured with a higher priority than MeasGapId #1.

In the measurement control information, two measurement objects (MOs) are configured, the measurement object #1 (MO1) for NR RF channel 1 is associated with MeasGapId #1, and measurement object #2 (MO2) for NR RF channel 2 is associated with MeasGapId #2. And it is indicated to the UE that event-triggered reporting with Event A3 is used.

Before the test, UE is connected to Cell 1 (PCell) on radio channel 1. The UE is configured with two dedicated BWPs for Cell 1 (PCell), BWP-1 and BWP-2. BWP-1 includes bandwidth of the SSB, and *preConfGapStatus* of the pre-MG (MeasGapId #1) for measurements on BWP-1 is set to ‘0’, *preConfGapStatus* of the pre-MG (MeasGapId #2) for measurements on BWP-1 is set to ‘1’; BWP-2 does not include bandwidth of the SSB, and *preConfGapStatus* of the pre-MG (MeasGapId #1) for measurements on BWP-2 is set to ‘1’, *preConfGapStatus* of the pre-MG (MeasGapId #2) for measurements on BWP-2 is set to ‘0’.

The test consists of three successive time periods, with time duration of T1, T2, and T3 respectively.

During T1, UE active DL BWP is BWP-1, and the pre-configured gap (MeasGapId #1) is deactivated, pre-configured gap (MeasGapId #2) is activated. Cell 3 is switched ON from the beginning of T1, and UE is supposed to search Cell 3 in MeasGapId #2.

The time period T2 starts when a DCI format 1\_1 command for PCell DL BWP switch, sent from the test equipment to the UE, is received at the UE side in PCell’s slot # denoted *i*. The UE shall switch its DL active BWP from BWP-1 to BWP-2, and the pre-configured gap (MeasGapId #1) is activated and pre-configured gap (MeasGapId #2) is deactivated.

At the beginning of T3, Cell 2 is switched ON, and UE is supposed to search Cell 2 in MeasGapId#1.

During T1, UE shall perform inter-frequency measurement with pre-MG (MeasGapId #2) activated.

During T3, UE shall perform intra-frequency measurement with pre-MG (MeasGapId #1) activated.

Table A.6.6.x1.2.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations. | |

Table A.6.6.x1.2.2-2: General test parameters for SA intra-frequency event triggered reporting with concurrent gap with pre-configured gaps and network-controlled activation/deactivation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| Active cell |  | 1, 2, 3 | Cell 1 |  |
| Neighbour cell |  | 1, 2, 3 | Cell 2, Cell 3 | Cell to be identified. |
| RF Channel Number |  | 1, 2, 3 | 1: Cell 1 and Cell 2, 2: Cell 3 |  |
| Measurement gap type |  | 1, 2, 3 | Per-UE Pre-MG gaps |  |
| Pre-MG Gap Pattern Id |  | 1, 2, 3 | 0 for MeasGapId #1  1 for MeasGapId #2 |  |
| Measurement gap offset |  | 1, 2, 3 | 39 for MeasGapId #1  19 for MeasGapId #2 |  |
| SSB configuration |  | 1 | SSB.1 FR1 |  |
|  |  | 2 | SSB.1 FR1 |  |
|  |  | 3 | SSB.2 FR1 |  |
| SMTC configuration |  | 1 | SMTC.2 |  |
|  |  | 2 | SMTC.1 |  |
|  |  | 3 | SMTC.1 |  |
| CSI-RS parameters |  | 1 | CSI-RS.1.2 FDD resource #0 |  |
|  |  | 2 | CSI-RS.1.2 TDD resource #0 |  |
|  |  | 3 | CSI-RS.2.2 TDD resource #0 |  |
| A3-Offset | dB | 1, 2, 3 | -4.5 |  |
| CP length |  | 1, 2, 3 | Normal |  |
| Hysteresis | dB | 1, 2, 3 | 0 |  |
| Time To Trigger | s | 1, 2, 3 | 0 |  |
| Filter coefficient |  | 1, 2, 3 | 0 | L3 filtering is not used |
| DRX | ms | 1, 2, 3 | OFF | DRX is not used |
| Time offset between serving and neighbour cells |  | 1 | 3 ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
|  |  | 2 | 3 μs | Synchronous cells |
|  |  | 3 | 3 μs | Synchronous cells |
| T1 | s | 1, 2, 3 | 5 |  |
| T2 | s | 1, 2, 3 | 0.1 |  |
| T3 | s | 1, 2, 3 | 5 |  |

Table A.6.6.x1.2.2-3: NR Cell specific test parameters for SA intra-frequency event triggered reporting with concurrent gap with pre-configured gaps and network-controlled activation/deactivation

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | | Cell 2 | | | Cell 3 | | |
|  |  |  | T1 | T2 | T3 | T1 | T2 | T3 | T1 | T2 | T3 |
| TDD configuration |  | 1 | N/A | | | N/A | | | N/A | | |
|  |  | 2 | TDDConf.1.1 | | | TDDConf.1.1 | | | TDDConf.1.1 | | |
|  |  | 3 | TDDConf.2.1 | | | TDDConf.2.1 | | | TDDConf.2.1 | | |
| PDSCH RMC configuration |  | 1 | SR.1.1 FDD | | | N/A | | | N/A | | |
|  |  | 2 | SR.1.1 TDD | | |  | | |  | | |
|  |  | 3 | SR.2.1 TDD | | |  | | |  | | |
| RMSI CORESET RMC configuration |  | 1 | CR.1.1 FDD | | | N/A | | | N/A | | |
|  |  | 2 | CR.1.1 TDD | | | N/A | | | N/A | | |
|  |  | 3 | CR.2.1 TDD | | | N/A | | | N/A | | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.1.2 FDD | | | N/A | | | N/A | | |
|  |  | 2 | CCR.1.2 TDD | | | N/A | | | N/A | | |
|  |  | 3 | CCR.2.1 TDD | | | N/A | | | N/A | | |
| OCNG Patterns |  | 1, 2, 3 | OP.1 | | | OP.1 | | | OP.1 | | |
| TRS configuration |  | 1 | TRS.1.1 FDD | | | N/A | | | N/A | | |
|  |  | 2 | TRS.1.1 TDD | | | N/A | | | N/A | | |
|  |  | 3 | TRS.1.2 TDD | | | N/A | | | N/A | | |
| Initial BWP configuration |  | 1, 2, 3 | DLBWP.0.1 ULBWP.0.1 | | | N/A | | | N/A | | |
| Active DL BWP configuration for BWP-1 |  | 1, 2, 3 | DLBWP.1.3 | | | N/A | | | N/A | | |
| Active UL BWP configuration for BWP-1 |  | 1, 2, 3 | ULBWP.1.3 | | | N/A | | | N/A | | |
| Active DL BWP configuration for BWP-2 |  | 1, 2, 3 | DLBWP.1.2 | | | N/A | | | N/A | | |
| Active UL BWP configuration for BWP-2 |  | 1, 2, 3 | ULBWP.1.2 | | | N/A | | | N/A | | |
| RLM-RS |  | 1, 2, 3 | CSI-RS | | | N/A | | | N/A | | |
| Note 2 | dBm/SCS | 1 | -98 | | | -98 | | | -98 | | |
| 2 | -98 | | | -98 | | | -98 | | |
| 3 | -95 | | | -95 | | | -95 | | |
| Note 2 | dBm/15 kHz | 1 | -98 | | | -98 | | | -98 | | |
| 2 | -98 | | | -98 | | | -98 | | |
| 3 | -95 | | | -95 | | | -95 | | |
|  | dB | 1,2,3 | 4 | | -1.46 | -Infinity | | -1.46 | -1.46 | -Infinity | |
|  | dB | 1,2,3 | 4 | | 4 | -Infinity | | 4 | 4 | -Infinity | |
| SS-RSRP Note 3 | dBm/SCS kHz | 1,2 | -94 | | -94 | -Infinity | | -94 | -94 | -Infinity | |
|  |  | 3 | -91 | | -91 | -Infinity | | -91 | -91 | -Infinity | |
| Io | dBm/9.36 MHz | 1,2 | -64.60 | | -62.25 | -Infinity | | -62.25 | -62.25 | -Infinity | |
|  | dBm/38.16 MHz | 3 | -58.50 | | -56.16 | -Infinity | | -56.16 | -56.16 | -Infinity | |
| Propagation Condition |  | 1, 2, 3 | AWGN | | | | | | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2 and T4.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | | | |

##### A.6.6.x1.2.3 Test Requirements

During T1,

* UE shall report corresponding HARQ-ACK/NACK for those PDSCHs scheduled in the slots overlapped with the pre-MG occasions of MeasGapId #1; and
* [the UE shall NOT be able to receive PDSCH and report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with the Pre-MG occasions of MeasGapId #2.]

The UE shall send one Event A3 triggered measurement report of cell 3 on RF channel 2, with a measurement reporting delay less than 1520 ms from the beginning of time period T1.

During T2 and starting from the 1st complete Pre-MG occasion after the beginning of PCell’s DL slot (*i+TBWPswitchDelay*) + 5ms + 2ms as defined in clause 8.19.5.2,

* [the UE shall NOT be able to receive PDSCH and report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with the Pre-MG occasions of MeasGapId #1;] and
* the UE shall report corresponding HARQ-ACK/NACK for those PDSCHs scheduled in the slots overlapped with the pre-MG occasions of MeasGapId #2.

The UE shall send one Event A3 triggered measurement report of cell 2 on RF channel 1, with a measurement reporting delay less than 800 ms from the beginning of time period T3.

During T3,

* [the UE shall NOT be able to receive PDSCH and report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with the Pre-MG occasions of MeasGapId #1,] and
* the UE shall report corresponding HARQ-ACK/NACK for those PDSCHs scheduled in the slots overlapped with the pre-MG occasions of MeasGapId #2.

The UE is not required to read the neighbour cell SSB index in this test.

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.

**----------------------END OF CHANGE 1----------------------------**

**----------------------START OF CHANGE 2----------------------------**

### A.6.6.x2 SA event triggered reporting tests for concurrent measurement gaps with NCSG

#### A.6.6.x2.1 SA event triggered reporting tests for FR1 concurrent gaps with NCSG for partially partial overalpping scenario for SSB-based measurements in both inter-frequency layers

##### A.6.6.x2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the concurrent gaps with NCSG capable UE makes correct reporting of events. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3.10.

In this test, there are three cells: NR cell 1 as PCell in FR1 on NR RF channel 1, NR cell 2 as neighbour cell in FR1 on NR RF channel 2, and NR cell 3 as neighbour cell in FR1 on NR RF channel 3. The test parameters are given in Tables A.6.6.x2.1.1-1, A.6.6.x2.1.1-2 and A.6.6.x2.1.1-3.

One measurement gap and one NCSG are configured to UE with measurement gap pattern #0 and NCSG pattern #1 respectively. Measurement gap with pattern #0 is associated with intra-frequency measurement on NR cell 2, and NCSG with pattern #1 is associated with inter-frequency measurement on NR cell 3 as defined in Table A.6.6.x2.1.1-2.

NCSG is configured with higher priority than measurement gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used for both frequency layers. 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 NR cell 2 and NR cell 3.

During T2, the UE is continuously scheduled with data on the PCell.

Table A.6.6.x2.1.1-1: SA event triggered reporting tests for FR1-FR1

|  |  |
| --- | --- |
| Config | Description |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations  Note 2: Target NR cells have the same SCS, BW and duplex mode as NR serving cells | |

Table A.6.6.x2.1.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 concurrent NCSGs with partially partially overalpping scenario for SSB-based measurements in both inter-frequency layers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | | Comment |
|  |  |  |  |
| NR RF Channel Number |  | Config 1,2,3 | 1, 2, 3 | | Three FR1 NR carrier frequencies are used. |
| Active cell |  | Config 1,2,3 | NR cell 1 (Pcell) | | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2,3 | NR cells 2 and 3 | | NR cell 2 is on NR RF channel number 2. NR cell 3 is on NR RF channel number 3. |
| Measurement Gap Pattern Id |  | Config 1,2,3 | 0 | | As specified in clause 9.1.2-1. |
| Measurement Gap offset |  | Config 1,2,3 | 39 | |  |
| NCSG Pattern Id |  | Config 1,2,3 | 1 | | As specified in clause 9.1.2-1. |
| NCSG offset |  | Config 1,2,3 | 4 | |  |
| A3-Offset | dB | Config 1,2,3 | -6 | |  |
| Hysteresis | dB | Config 1,2,3 | 0 | |  |
| CP length |  | Config 1,2,3 | Normal | |  |
| TimeToTrigger | s | Config 1,2,3 | 0 | |  |
| Filter coefficient |  | Config 1,2,3 | 0 | | L3 filtering is not used |
| DRX |  | Config 1,2,3 | OFF | | DRX is not used |
| Time offset between serving and neighbour cell 1 |  | Config 1, 2, 3 | 3μs | | Synchronous. |
| Time offset between serving and neighbour cell 2 |  | Config 1, 2, 3 | 5ms | | Asynchronous.  The timing of Cell 3 is 5ms later than the timing of Cell 1. |
| T1 | s | Config 1,2,3 | 5 | |  |
| T2 | s | Config 1,2,3 | 1.5 | 1.5 |  |

Table A.6.6.x2.1.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 Con-NCSG gaps with partially partially overalpping scenario for SSB-based measurements in both inter-frequency layers

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Cell 1 | | Cell 2 | | Cell 3 | |
|  | |  |  | T1 | T2 | T1 | T2 | T1 | T2 |
| NR RF Channel Number | |  | Config 1,2,3 | 1 | | 2 | | 3 | |
| Duplex mode | |  | Config 1 | FDD | | | | | |
|  | |  | Config 2,3 | TDD | | | | | |
| TDD configuration | |  | Config 1 | Not Applicable | | | | | |
|  | |  | Config 2 | TDDConf.1.1 | | | | | |
|  | |  | Config 3 | TDDConf.2.1 | | | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | |
|  | |  | Config 3 | 40: NRB,c = 106 | | | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | |
|  | |  | Config 3 | 40: NRB,c = 106 | | | | | |
| BWP configuration | Initial DL BWP |  | Config 1, 2, 3 | DLBWP.0.1 | | NA | | NA | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | NA | | NA | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | NA | | NA | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | NA | | NA | |
| TRS configuration | |  | Config 1 | TRS.1.1 FDD | | NA | | NA | |
|  | |  | Config 2 | TRS.1.1 TDD | | NA | | NA | |
|  | |  | Config 3 | TRS.1.2 TDD | | NA | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2,3 | OP.1 | | OP.1 | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1 | SR.1.1 FDD | |  | |  | |
|  | |  | Config 2 | SR.1.1 TDD | |  | |  | |
|  | |  | Config 3 | SR.2.1 TDD | |  | |  | |
| RMSI CORESET Reference Channel | |  | Config 1 | CR.1.1 FDD | |  | |  | |
|  | |  | Config 2 | CR.1.1 TDD | |  | |  | |
|  | |  | Config 3 | CR.2.1 TDD | |  | |  | |
| Dedicated CORESET Reference Channel | |  | Config 1 | CCR.1.1 FDD | |  | |  | |
|  | Config 2 | CCR.1.1 TDD | |  | |  | |
|  | Config 3 | CCR.2.1 TDD | |  | |  | |
| SSB parameters | |  | Config 1,2,3 | SSB.1 FR1 | | SSB.1 FR1 | | SSB.1 FR1 | |
| SMTC configuration defined in A.3.11 | |  | Config 1,2,3 | SMTC.2 | | SMTC.2 | | SMTC.2 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | | | |
|  | |  | Config 3 | 30 | | | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2,3 | 0 | | 0 | | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | |  | |  | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |  |  | |  | |  | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | |  | |  | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |  |  | |  | |  | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | |  | |  | |
| Note2 | | dBm/15kHz |  | -98 | | -98 | | -98 | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | | -98 | |
|  | |  | Config 3 | -95 | | -95 | | -95 | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | -Infinity | -91 | -Infinity | -91 |
|  | |  | Config 3 | -91 | -91 | -Infinity | -88 | -Infinity | -88 |
|  | | dB | Config 1,2,3 | 4 | 4 | -Infinity | 7 | -Infinity | 7 |
|  | | dB | Config 1,2,3 | 4 | 4 | -Infinity | 7 | -Infinity | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | -70.05 | -62.26 | -70.05 | -62.26 |
|  | | dBm/38.16MHz | Config 3 | -58.49 | -58.49 | -63.94 | -56.15 | -63.94 | -56.15 |
| Propagation Condition | |  | Config 1,2,3 | AWGN | | AWGN | | AWGN | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | | | |

##### A.6.6.x2.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for each neighboring cell, with a measurement reporting delay less than [1280] ms for cell 2 and [1280ms] for cell 3 from the beginning of time period T2.

During T2, UE shall send HARQ-ACK/NACK for the corresponding PDSCH scheduled in PCell in all the slots except for the case where PDSCH or PUCCH is overlapped with the VIL of NCSG pattern after considering the collision between NCSGs.

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.6.6.x2.2 SA event triggered reporting tests for FR1 concurrent gaps with NCSG for partially partial overalpping scenario for SSB-based measurements in both inter-frequency layers

##### A.6.6.x2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the concurrent gaps with NCSG capable UE makes correct reporting of events. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3.10.

In this test, there are three cells: NR cell 1 as PCell in FR1 on NR RF channel 1, NR cell 2 as neighbour cell in FR1 on NR RF channel 2, and NR cell 3 as neighbour cell in FR1 on NR RF channel 3. The test parameters are given in Tables A.6.6.x2.2.1-1, A.6.6.x2.2.1-2 and A.6.6.x2.2.1-3.

Two NCSG patterns (NCSGId #0 and NCSGId #1) are configured with the NCSG pattern ID #0 and #1 as defined in Table A.6.6.x2.2.1-2. NCSGId #1 is configured with a higher priority than NCSGId #0.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used for both frequency layers. 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 NR cell 2 and NR cell 3.

During T2, the UE is continuously scheduled with data on the PCell.

Table A.6.6.x2.2.1-1: SA event triggered reporting tests for FR1-FR1

|  |  |
| --- | --- |
| Config | Description |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations  Note 2: Target NR cells have the same SCS, BW and duplex mode as NR serving cells | |

Table A.6.6.x2.2.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 concurrent NCSGs with partially partially overalpping scenario for SSB-based measurements in both inter-frequency layers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | | Comment |
|  |  |  |  |
| NR RF Channel Number |  | Config 1,2,3 | 1, 2, 3 | | Three FR1 NR carrier frequencies are used. |
| Active cell |  | Config 1,2,3 | NR cell 1 (Pcell) | | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2,3 | NR cells 2 and 3 | | NR cell 2 is on NR RF channel number 2. NR cell 3 is on NR RF channel number 3. |
| NCSG Pattern Id |  | Config 1,2,3 | 0 for NCSGId #0  1 for NCSGId #1 | | As specified in clause 9.1.2-1. |
| NCSG offset |  | Config 1,2,3 | 79 for NCSGId #0  19 for NCSGpId #1 | |  |
| A3-Offset | dB | Config 1,2,3 | -6 | |  |
| Hysteresis | dB | Config 1,2,3 | 0 | |  |
| CP length |  | Config 1,2,3 | Normal | |  |
| TimeToTrigger | s | Config 1,2,3 | 0 | |  |
| Filter coefficient |  | Config 1,2,3 | 0 | | L3 filtering is not used |
| DRX |  | Config 1,2,3 | OFF | | DRX is not used |
| Time offset between serving and neighbour cell 1 |  | Config 1, 2, 3 | 3μs | | Synchronous. |
| Time offset between serving and neighbour cell 2 |  | Config 1, 2, 3 | 5ms | | Asynchronous.  The timing of Cell 3 is 5ms later than the timing of Cell 1. |
| T1 | s | Config 1,2,3 | 5 | |  |
| T2 | s | Config 1,2,3 | 1.5 | 1.5 |  |

Table A.6.6.x2.2.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 Con-NCSG gaps with partially partially overalpping scenario for SSB-based measurements in both inter-frequency layers

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Cell 1 | | Cell 2 | | Cell 3 | |
|  | |  |  | T1 | T2 | T1 | T2 | T1 | T2 |
| NR RF Channel Number | |  | Config 1,2,3 | 1 | | 2 | | 3 | |
| Duplex mode | |  | Config 1 | FDD | | | | | |
|  | |  | Config 2,3 | TDD | | | | | |
| TDD configuration | |  | Config 1 | Not Applicable | | | | | |
|  | |  | Config 2 | TDDConf.1.1 | | | | | |
|  | |  | Config 3 | TDDConf.2.1 | | | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | |
|  | |  | Config 3 | 40: NRB,c = 106 | | | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | |
|  | |  | Config 3 | 40: NRB,c = 106 | | | | | |
| BWP configuration | Initial DL BWP |  | Config 1, 2, 3 | DLBWP.0.1 | | NA | | NA | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | NA | | NA | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | NA | | NA | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | NA | | NA | |
| TRS configuration | |  | Config 1 | TRS.1.1 FDD | | NA | | NA | |
|  | |  | Config 2 | TRS.1.1 TDD | | NA | | NA | |
|  | |  | Config 3 | TRS.1.2 TDD | | NA | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2,3 | OP.1 | | OP.1 | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1 | SR.1.1 FDD | |  | |  | |
|  | |  | Config 2 | SR.1.1 TDD | |  | |  | |
|  | |  | Config 3 | SR.2.1 TDD | |  | |  | |
| RMSI CORESET Reference Channel | |  | Config 1 | CR.1.1 FDD | |  | |  | |
|  | |  | Config 2 | CR.1.1 TDD | |  | |  | |
|  | |  | Config 3 | CR.2.1 TDD | |  | |  | |
| Dedicated CORESET Reference Channel | |  | Config 1 | CCR.1.1 FDD | |  | |  | |
|  | Config 2 | CCR.1.1 TDD | |  | |  | |
|  | Config 3 | CCR.2.1 TDD | |  | |  | |
| SSB parameters | |  | Config 1,2,3 | SSB.1 FR1 | | SSB.1 FR1 | | SSB.1 FR1 | |
| SMTC configuration defined in A.3.11 | |  | Config 1,2,3 | SMTC.2 | | SMTC.2 | | SMTC.2 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | | | |
|  | |  | Config 3 | 30 | | | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2,3 | 0 | | 0 | | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | |  | |  | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |  |  | |  | |  | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | |  | |  | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |  |  | |  | |  | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | |  | |  | |
| Note2 | | dBm/15kHz |  | -98 | | -98 | | -98 | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | | -98 | |
|  | |  | Config 3 | -95 | | -95 | | -95 | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | -Infinity | -91 | -Infinity | -91 |
|  | |  | Config 3 | -91 | -91 | -Infinity | -88 | -Infinity | -88 |
|  | | dB | Config 1,2,3 | 4 | 4 | -Infinity | 7 | -Infinity | 7 |
|  | | dB | Config 1,2,3 | 4 | 4 | -Infinity | 7 | -Infinity | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | -70.05 | -62.26 | -70.05 | -62.26 |
|  | | dBm/38.16MHz | Config 3 | -58.49 | -58.49 | -63.94 | -56.15 | -63.94 | -56.15 |
| Propagation Condition | |  | Config 1,2,3 | AWGN | | AWGN | | AWGN | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | | | |

##### A.6.6.x2.2.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for each neighboring cell, with a measurement reporting delay less than [1280] ms for cell 2 and [1280ms] for cell 3 from the beginning of time period T2.

During T2, UE shall send HARQ-ACK/NACK for the corresponding PDSCH scheduled in PCell in all the slots except for the case where PDSCH or PUCCH is overlapped with the VIL of NCSG pattern after considering the collision between NCSGs.

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.

**----------------------END OF CHANGE 2----------------------------**

**----------------------START OF CHANGE 3----------------------------**

### A.6.6.x3 SA event triggered reporting tests with NeedForGap in FR1

#### A.6.6.x3.1 SA event triggered reporting tests without gaps, with interruptions, under non-DRX

##### A.6.6.x3.1.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event, and to verify that the interruption ratio does not exceed the limits for the NR PCell during the measurement without gaps and with interruptions. This test will partly verify the cell search requirements in clauses 9.2.5.1 and 9.2.5.2 for measurements performed without gaps and with interruptions. This test will also verify the interruption ratio for PCell in standalone NR specified in clause 8.2.2.2.19. The test will measure that the measurement delay is within the specified boundaries.

The serving frequency should be selected for which UE reports ‘no-gap’ in NeedForGapsIntraFreq-r16 and ‘no-gap-no-interruption’ in interruptionIndication-r18.

##### A.6.6.x3.1.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters for PCell are given in Table A.6.6.x3.1.2-1, A.6.6.x3.1.2-2 and A.6.6.x3.1.2-3 below. In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

The UE is capable of measurements without gaps with interruption and report ‘no-gap’ through NeedForGapsIntraFreq-r16 and ‘no-gap-no-interruption’ in interruptionIndication-r18 for PCell. UE needs to be provided with new Timing Advance Command MAC control element at least once during each time alignment timer period to maintain uplink time alignment.

Table A.6.6.x3.1.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations. | |

Table A.6.6.x3.1.2-2: General test parameters for SA intra-frequency event triggered reporting without gap for PCell in FR1 without DRX

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| Active cell |  | 1, 2, 3 | Cell 1 |  |
| Neighbour cell |  | 1, 2, 3 | Cell 2 | Cell to be identified. |
| RF Channel Number |  | 1, 2, 3 | 1: Cell 1 and Cell 2 |  |
| SSB configuration |  | 1 | SSB.1 FR1 |  |
|  |  | 2 | SSB.1 FR1 |  |
|  |  | 3 | SSB.2 FR1 |  |
| SMTC configuration |  | 1 | SMTC.2 |  |
|  |  | 2 | SMTC.1 |  |
|  |  | 3 | SMTC.1 |  |
| A3-Offset | dB | 1, 2, 3 | -4.5 |  |
| CP length |  | 1, 2, 3 | Normal |  |
| Hysteresis | dB | 1, 2, 3 | 0 |  |
| Time To Trigger | s | 1, 2, 3 | 0 |  |
| Filter coefficient |  | 1, 2, 3 | 0 | L3 filtering is not used |
| Time offset between serving and neighbour cells |  | 1 | 3 ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
|  |  | 2 | 3 μs | Synchronous cells |
|  |  | 3 | 3 μs | Synchronous cells |
| T1 | s | 1, 2, 3 | [5] |  |
| T2 | s | 1, 2, 3 | [10] | [10] |

Table A.6.6.x3.1.2-3: NR Cell specific test parameters for SA intra-frequency event triggered reporting without gap for PCell in FR1 without DRX

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | Cell 2 | |
|  |  |  | T1 | T2 | T1 | T2 |
| TDD configuration |  | 1 | TN/A | | TN/A | |
|  |  | 2 | TDDConf.1.1 | | TDDConf.1.1 | |
|  |  | 3 | TDDConf.2.1 | | TDDConf.2.1 | |
| PDSCH RMC configuration |  | 1 | SR.1.1 FDD | | N/A | |
|  |  | 2 | SR.1.1 TDD | |  | |
|  |  | 3 | SR.2.1 TDD | |  | |
| RMSI CORESET RMC configuration |  | 1 | CR.1.1 FDD | | N/A | |
|  |  | 2 | CR.1.1 TDD | | N/A | |
|  |  | 3 | CR.2.1 TDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.1.1 FDD | | N/A | |
|  |  | 2 | CCR.1.1 TDD | | N/A | |
|  |  | 3 | CCR.2.1 TDD | | N/A | |
| OCNG Patterns |  | 1, 2, 3 | OP.1 | | OP.1 | |
| TRS configuration |  | 1 | TRS.1.1 FDD | | N/A | |
| 2 | TRS.1.1 TDD | | N/A | |
| 3 | TRS.1.2 TDD | | N/A | |
| Initial BWP configuration |  | 1, 2, 3 | DLBWP.0.1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2, 3 | [DLBWP.1.2] | | [DLBWP.1.2] | |
| Active UL BWP configuration |  | 1, 2, 3 | [ULBWP.1.2] | | [ULBWP.1.2] | |
| RLM-RS |  | 1, 2, 3 | CSI-RS | | SSB | |
| Note 2 | dBm/SCS | 1 | -98 | | | |
|  |  | 2 | -98 | | | |
|  |  | 3 | -95 | | | |
| Note 2 | dBm/15 kHz | 1 | -98 | | | |
|  |  | 2 |  | | | |
|  |  | 3 |  | | | |
|  | dB | 1 | 4 | -1.46 | -Infinity | -1.46 |
|  |  | 2 |  |  |  |  |
|  |  | 3 |  |  |  |  |
|  | dB | 1 | 4 | 4 | -Infinity | 4 |
|  |  | 2 |  |  |  |  |
|  |  | 3 |  |  |  |  |
| SS-RSRP Note 3 | dBm/SCS kHz | 1 | -94 | -94 | -Infinity | -94 |
|  |  | 2 | -94 | -94 | -Infinity | -94 |
|  |  | 3 | -91 | -91 | -Infinity | -91 |
| Io | dBm/9.36 MHz | 1 | -64.60 | -62.25 | --64.60 | -62.25 |
|  | dBm/9.36 MHz | 2 | -64.60 | -62.25 | --64.60 | -62.25 |
|  | dBm/38.16 MHz | 3 | -58.50 | -56.16 | --58.50 | -56.16 |
| Propagation Condition |  | 1, 2, 3 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

##### A.6.6.x3.1.3 Test Requirements

The UE shall be continuously scheduled on PCell during the entire length of T1 and T2.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [1240] ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test.

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%.

During [1240]ms from the beginning of time period T2, the UE shall transmit ACK/NACK in PCell and the rate of missed ACK/NACK shall no more than 2.5%.

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.6.6.x3.2 SA event triggered reporting tests for FR1 without gap with interruption for inter-frequency measurement with SSB time index detection when DRX is not used

A.6.6.x3.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3.9 and interruption requirements during measurement without gap in clause 8.2.2.2.19.

The serving frequency and the target frequency should be selected such that UE reports ‘no-gap’ via needForGapsInfoNR-r16 and ‘no-gap-no-interruption’ via NeedForInterruptionNR-r18 for the target frequency given the serving frequency.

##### A.6.6.x3.2.2 Test parameters

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2. NR RF channel 1 and NR RF channel 2 should be selected such that UE reports ‘no-gap’ and ‘nogap-withinterruption’ for the target frequency on NR RF channel 2. The test parameters are given in Tables A.6.6.x3.2.2-1, A.6.6.x3.2.2-2 and A.6.6.x3.2.2-3.

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 NR cell 2.

During T2, the UE is continuously scheduled with data on the PCell.

**Table A.6.6.x3.2.2-1: SA event triggered reporting tests for FR1 for inter-frequency measurement without gap with interruption**

|  |  |
| --- | --- |
| **Config** | **Description** |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations  Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell | |

**Table A.6.6.x3.2.2-2: General test parameters for SA event triggered reporting tests for FR1 for inter-frequency measurement without gap with interruption**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| NR RF Channel Number |  | Config 1,2,3 | 1, 2 | Two FR1 NR carrier frequencies are used. |
| Active cell |  | Config 1,2,3 | NR Cell 1 (PCell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2,3 | NR Cell 2 | NR Cell 2 is on NR RF channel number 2. |
| A3-Offset | dB | Config 1,2,3 | -6 |  |
| Hysteresis | dB | Config 1,2,3 | 0 |  |
| CP length |  | Config 1,2,3 | Normal |  |
| TimeToTrigger | s | Config 1,2,3 | 0 |  |
| Filter coefficient |  | Config 1,2,3 | 0 | L3 filtering is not used |
| DRX |  | Config 1,2,3 | OFF | DRX is not used |
| Time offset between serving and neighbour cells |  | Config 1 | 3ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
|  | Config 2,3 | 3μs | Synchronous cells. |
| T1 | s | Config 1,2,3 | 5 |  |
| T2 | s | Config 1,2,3 | 2 |  |

**Table A.6.6.x3.2.2-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without gap**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| NR RF Channel Number | |  | Config 1,2,3 | 1 | | 2 | |
| Duplex mode | |  | Config 1 | FDD | | | |
|  | Config 2,3 | TDD | | | |
| TDD configuration | |  | Config 1 | Not Applicable | | | |
|  | Config 2 | TDDConf.1.1 | | | |
|  | Config 3 | TDDConf.2.1 | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | |
| Config 3 | 40: NRB,c = 106 | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | |
| Config 3 | 40: NRB,c = 106 | | | |
| BWP configuration | Initial DL BWP |  | Config 1, 2, 3 | DLBWP.0.1 | | NA | |
| Initial UL BWP |  | ULBWP.0.1 | | NA | |
| Dedicated DL BWP |  | DLBWP.1.1 | | NA | |
| Dedicated UL BWP |  | ULBWP.1.1 | | NA | |
| TRS configuration | |  | Config 1 | TRS.1.1 FDD | | NA | |
| Config 2 | TRS.1.1 TDD | | NA | |
| Config 3 | TRS.1.2 TDD | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2,3 | OP.1 | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1 | SR.1.1 FDD | |  | |
|  | Config 2 | SR.1.1 TDD | |  | |
|  | Config 3 | SR2.1 TDD | |  | |
| CORESET Reference Channel | |  | Config 1 | CR.1.1 FDD | |  | |
|  | Config 2 | CR.1.1 TDD | |  | |
|  | Config 3 | CR2.1 TDD | |  | |
| SSB parameters | |  | Config 1 | SSB.1 FR1 | | SSB.5 FR1 | |
|  | Config 2 | SSB.1 FR1 | | SSB.5 FR1 | |
|  | Config 3 | SSB.2 FR1 | | SSB.6 FR1 | |
| SMTC configuration defined in A.3.11 | |  | Config 1 | SMTC.2 | | SMTC.5 | |
|  | Config 2, 3 | SMTC.1 | | SMTC.4 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | |
| Config 3 | 30 | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2,3 | 0 | | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |  |
| EPRE ratio of PBCH to PBCH DMRS | |  |
| EPRE ratio of PDCCH DMRS to SSS | |  |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |
| EPRE ratio of PDSCH DMRS to SSS | |  |
| EPRE ratio of PDSCH to PDSCH | |  |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |
| Note2 | | dBm/15kHz |  | -98 | | -98 | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | |
| Config 3 | -95 | | -95 | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | -Infinity | -91 |
| Config 3 | -91 | -91 | -Infinity | -88 |
|  | | dB | Config 1,2,3,4,5,6 | 4 | 4 | -Infinity | 7 |
|  | | dB | Config 1,2,3 | 4 | 4 | -Infinity | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | -70.05 | -62.26 |
| dBm/38.16MHz | Config 3 | -58.49 | -58.49 | -63.94 | -56.15 |
| Propagation Condition | |  | Config 1,2,3 | AWGN | | AWGN | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | |

A.6.6.x3.2.3 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1520 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90%.

During 1520ms from the beginning of time period T2, the UE shall transmit ACK/NACK in PCell and the rate of missed ACK/NACKs shall no more than 2.5%.

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.6.6.x3.3 SA event triggered reporting tests for FR1 with ‘no-gap-with-interruption’, without measurement gap or DRX

##### A.6.6.x3.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3.4.

The serving frequency and the target frequency should be selected such that UE reports ‘no-gap-with-interruption’ for the target frequency given the serving frequency.

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2. Supported test configurations are shown in table A.6.6.x3.3.1-1. The general test parameters are given in Tables A.6.6.x3.3.1-2, and cell specific test parameters are given in Table A.6.6.x3.3.1-3.

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 NR cell 2.

The TE schedules continuous DL data on PCell during the test duration.

Table A.6.6.x3.3.1-1: SA event triggered reporting tests without SSB index reading for FR1-FR1

|  |  |
| --- | --- |
| Config | Description |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | NR 30kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations  Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell | |

Table A.6.6.x3.3.1-2: General test parameters for SA inter-frequency event triggered reporting for FR2 without SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
|  |  |  |  |
| NR RF Channel Number |  | Config 1,2,3 | 1, 2 | Two FR1 NR carrier frequencies is used. |
| Active cell |  | Config 1,2,3 | NR cell 1 (Pcell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2,3 | NR cell2 | NR cell 2 is on NR RF channel number 2. |
| SMTC for NR RF channel number 2 |  | Config 1,2,3 | SMTC.3 | As specified in clause A.3.11 |
| A3-Offset | dB | Config 1,2,3 | -6 |  |
| Hysteresis | dB | Config 1,2,3 | 0 |  |
| CP length |  | Config 1,2,3 | Normal |  |
| TimeToTrigger | s | Config 1,2,3 | 0 |  |
| Filter coefficient |  | Config 1,2,3 | 0 | L3 filtering is not used |
| DRX |  | Config 1,2,3 | OFF | DRX is not used |
| Time offset between serving and neighbour cells |  | Config 1,2,3 | 3μs | Synchronous cells. |
| T1 | s | Config 1,2,3 | 5 |  |
| T2 | s | Config 1,2,3 | 1 |  |

Table A.6.6.x3.3.1-3: Cell specific test parameters for inter-frequency event triggered reporting without SSB time index detection

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  | |  |  | **T1** | **T2** | **T1** | **T2** |
| NR RF Channel Number | |  | Config 1,2,3 | 1 | | 2 | |
| Duplex mode | |  | Config 1 | FDD | | | |
|  | |  | Config 2,3 | TDD | | | |
| TDD configuration | |  | Config 1 | Not Applicable | | | |
|  | |  | Config 2 | TDDConf.1.1 | | | |
|  | |  | Config 3 | TDDConf.2.1 | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | |
|  | |  | Config 3 | 40: NRB,c = 106 | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | |
|  | |  | Config 3 | 40: NRB,c = 106 | | | |
| BWP configuration | Initial DL BWP |  | Config 1, 2, 3 | DLBWP.0.1 | | NA | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | NA | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | NA | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | NA | |
| TRS configuration | |  | Config 1 | TRS.1.1 FDD | | NA | |
|  | |  | Config 2 | TRS.1.1 TDD | | NA | |
|  | |  | Config 3 | TRS.1.2 TDD | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2,3 | OP.1 | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1 | SR.1.1 FDD | |  | |
|  | |  | Config 2 | SR.1.1 TDD | |  | |
|  | |  | Config 3 | SR2.1 TDD | |  | |
| RMSI CORESET Reference Channel | |  | Config 1 | CR.1.1 FDD | |  | |
|  | |  | Config 2 | CR.1.1 TDD | |  | |
|  | |  | Config 3 | CR2.1 TDD | |  | |
| Dedicated CORESET Reference Channel | |  | Config 1 | CCR.1.1 FDD | |  | |
|  | Config 2 | CCR.1.1 TDD | |  | |
|  | Config 3 | CCR.2.1 TDD | |  | |
| SSB parameters | |  | Config 1 | SSB.1 FR1 | | SSB.1 FR1 | |
|  | |  | Config 2 | SSB.1 FR1 | | SSB.1 FR1 | |
|  | |  | Config 3 | SSB.2 FR1 | | SSB.2 FR1 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | |
|  | |  | Config 3 | 30 | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2,3 | 0 | | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | |  | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | |  | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | |  | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |  |  | |  | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | |  | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | |  | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |  |  | |  | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | |  | |
| Note2 | | dBm/15kHz |  | -98 | | -98 | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | |
|  | |  | Config 3 | -95 | | -95 | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | -Infinity | -91 |
|  | |  | Config 3 | -91 | -91 | -Infinity | -88 |
|  | | dB | Config 1,2,3,4,5,6 | 4 | 4 | -Infinity | 7 |
|  | | dB | Config 1,2,3 | 4 | 4 | -Infinity | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | -70.05 | -62.26 |
|  | | dBm/38.16MHz | Config 3 | -58.49 | -58.49 | -63.94 | -56.15 |
| Propagation Condition | |  | Config 1,2,3 | AWGN | | AWGN | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | |

##### A.6.6.x3.3.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than X ms from the beginning of time period T2, where X is 2.56 s as derived based on inter-frequency measurement requirements in clause 9.3.4.

In the test, UE shall send HARQ ACK/NACK for the corresponding PDSCH scheduled in PCell in all the slots with an interruption ratio between number of interrupted slot over the total number of slots no larger than 1.25%.

In the test UE is not required to report SSB time index. 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.6.6.x3.4 SA event triggered reporting tests for FR1 NeedForGaps without gap without interruption when DRX is not used

A.6.6.x3.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3.9 and also verify the interruption during inter-frequency measurement with NeedForGaps.

The serving frequency and the target frequency should be selected for which UE supports *NeedForInterruptionInfoNR-R18* measurements and indicates ‘*no-gap-no-interruption*’ for the target frequency given the serving frequency.

##### A.6.6.x3.4.2 Test parameters

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2. NR RF channel 1 and NR RF channel 2 should be selected such that UE reports ‘*no-gap-no-interruption*’ for the target frequency on NR RF channel 2.

The test parameters are given in Tables A.6.6.x3.4.1-1, A.6.6.x3.4.1-2 and A.6.6.x3.4.1-3.

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 NR cell 2.

During T2, the UE is continuously scheduled with data on the PCell.

**Table A.6.6.x3.4.1-1: SA event triggered reporting tests without SSB index reading for FR1-FR1**

|  |  |
| --- | --- |
| **Config** | **Description** |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | NR 30kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations  Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell | |

**Table A.6.6.x3.4.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 with NeedForInterruption ‘no-gap-no-interruption’**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| NR RF Channel Number |  | Config 1,2,3 | 1, 2 | Two FR1 NR carrier frequencies is used. |
| Active cell |  | Config 1,2,3 | NR cell 1 (Pcell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2,3 | NR cell2 | NR cell 2 is on NR RF channel number 2. |
| A3-Offset | dB | Config 1,2,3 | -6 |  |
| Hysteresis | dB | Config 1,2,3 | 0 |  |
| CP length |  | Config 1,2,3 | Normal |  |
| TimeToTrigger | s | Config 1,2,3 | 0 |  |
| Filter coefficient |  | Config 1,2,3 | 0 | L3 filtering is not used |
| DRX |  | Config 1,2,3 | OFF | DRX is not used |
| Time offset between serving and neighbour cells |  | Config 1 | 3ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
|  | Config 2,3 | 3μs | Synchronous cells. |
| T1 | s | Config 1,2,3 | 5 |  |
| T2 | s | Config 1,2,3 | 1 |  |

**Table A.6.6.x3.4.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 with NeedForInterruption ‘no-gap-no-interruption’**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
| **T1** | **T2** | **T1** | **T2** |
| NR RF Channel Number | |  | Config 1,2,3 | 1 | | 2 | |
| Duplex mode | |  | Config 1 | FDD | | | |
|  | Config 2,3 | TDD | | | |
| TDD configuration | |  | Config 1 | Not Applicable | | | |
|  | Config 2 | TDDConf.1.1 | | | |
|  | Config 3 | TDDConf.2.1 | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | |
| Config 3 | 40: NRB,c = 106 | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | |
| Config 3 | 40: NRB,c = 106 | | | |
| BWP configuration | Initial DL BWP |  | Config 1, 2, 3 | DLBWP.0.1 | | NA | |
| Initial UL BWP |  | ULBWP.0.1 | | NA | |
| Dedicated DL BWP |  | DLBWP.1.1 | | NA | |
| Dedicated UL BWP |  | ULBWP.1.1 | | NA | |
| TRS configuration | |  | Config 1 | TRS.1.1 FDD | | NA | |
| Config 2 | TRS.1.1 TDD | | NA | |
| Config 3 | TRS.1.2 TDD | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2,3 | OP.1 | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1 | SR.1.1 FDD | |  | |
|  | Config 2 | SR.1.1 TDD | |  | |
|  | Config 3 | SR2.1 TDD | |  | |
| CORESET Reference Channel | |  | Config 1 | CR.1.1 FDD | |  | |
|  | Config 2 | CR.1.1 TDD | |  | |
|  | Config 3 | CR2.1 TDD | |  | |
| SSB parameters | |  | Config 1 | SSB.1 FR1 | | SSB.5 FR1 | |
|  | Config 2 | SSB.1 FR1 | | SSB.5 FR1 | |
|  | Config 3 | SSB.2 FR1 | | SSB.6 FR1 | |
| SMTC configuration defined in A.3.11 | |  | Config 1 | SMTC.2 | | SMTC.5 | |
|  | Config 2, 3 | SMTC.1 | | SMTC.4 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | |
| Config 3 | 30 | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2,3 | 0 | | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |  |
| EPRE ratio of PBCH to PBCH DMRS | |  |
| EPRE ratio of PDCCH DMRS to SSS | |  |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |
| EPRE ratio of PDSCH DMRS to SSS | |  |
| EPRE ratio of PDSCH to PDSCH | |  |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |
| Note2 | | dBm/15kHz |  | -98 | | -98 | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | |
| Config 3 | -95 | | -95 | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | -Infinity | -91 |
| Config 3 | -91 | -91 | -Infinity | -88 |
|  | | dB | Config 1,2,3,4,5,6 | 4 | 4 | -Infinity | 7 |
|  | | dB | Config 1,2,3 | 4 | 4 | -Infinity | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | -70.05 | -62.26 |
| dBm/38.16MHz | Config 3 | -58.49 | -58.49 | -63.94 | -56.15 |
| Propagation Condition | |  | Config 1,2,3 | AWGN | | AWGN | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | |

A.6.6.x3.4.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [200] ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

During T2, UE shall send HARQ-ACK/NACK for the corresponding PDSCH scheduled in PCell in all the slots.

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

The UE is not required to read the neighbour cell SSB index in this test.

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.6.6.x3.5 SA event triggered reporting tests without gap under non-DRX for UE indicating *no-gap-no-interruption*

##### A.6.6.x3.5.1 Test purpose and Environment

The purpose of this test is to verify that the UE which supports ‘*no-gap*’ makes correct reporting of an event and the UE performs intra-frequency measurement without gap without interuption when the UE indicates ‘*no-gap*’ via *intraFreq-needForGap* and the UE indicates *no-gap-no-interruption* via *NeedForInterruptionInfoNR-r18*. This test will partly verify the intra-frequency cell search requirements in clauses 9.2.5.1 and 9.2.5.2.

##### A.6.6.x3.5.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters for PCell and neighbour cell are given in Table A.6.6.x3.5.2-2 and A.6.6.x3.5.2-3 below. In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

Table A.6.6.x3.5.1.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations. | |

Table A.6.6.x3.5.2-2: General test parameters for SA intra-frequency event triggered reporting without gap for FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| Active cell |  | 1, 2, 3 | Cell 1 |  |
| Neighbour cell |  | 1, 2, 3 | Cell 2 | Cell to be identified. |
| RF Channel Number |  | 1, 2, 3 | 1: Cell 1 and Cell 2 |  |
| SSB configuration |  | 1 | SSB.1 FR1 |  |
|  |  | 2 | SSB.1 FR1 |  |
|  |  | 3 | SSB.2 FR1 |  |
| SMTC configuration |  | 1 | SMTC.2 |  |
|  |  | 2 | SMTC.1 |  |
|  |  | 3 | SMTC.1 |  |
| A3-Offset | dB | 1, 2, 3 | -4.5 |  |
| CP length |  | 1, 2, 3 | Normal |  |
| Hysteresis | dB | 1, 2, 3 | 0 |  |
| Time To Trigger | s | 1, 2, 3 | 0 |  |
| Filter coefficient |  | 1, 2, 3 | 0 | L3 filtering is not used |
| DRX |  | 1, 2, 3 |  | OFF |
| Time offset between serving and neighbour cells |  | 1 | 3 ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
|  |  | 2 | 3 μs | Synchronous cells |
|  |  | 3 | 3 μs | Synchronous cells |
| T1 | s | 1, 2, 3 | 5 |  |
| T2 | s | 1, 2, 3 | 5 |  |

Table A.6.6.x3.5.2-3: NR Cell specific test parameters for SA intra-frequency event triggered reporting without gap for FR1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | Cell 2 | |
|  |  |  | T1 | T2 | T1 | T2 |
| TDD configuration |  | 1 | TN/A | | TN/A | |
|  |  | 2 | TDDConf.1.1 | | TDDConf.1.1 | |
|  |  | 3 | TDDConf.2.1 | | TDDConf.2.1 | |
| PDSCH RMC configuration |  | 1 | SR.1.1 FDD | | N/A | |
|  |  | 2 | SR.1.1 TDD | |  | |
|  |  | 3 | SR.2.1 TDD | |  | |
| RMSI CORESET RMC configuration |  | 1 | CR.1.1 FDD | | N/A | |
|  |  | 2 | CR.1.1 TDD | | N/A | |
|  |  | 3 | CR.2.1 TDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.1.1 FDD | | N/A | |
|  |  | 2 | CCR.1.1 TDD | | N/A | |
|  |  | 3 | CCR.2.1 TDD | | N/A | |
| OCNG Patterns |  | 1, 2, 3 | OP.1 | | OP.1 | |
| TRS Configuration |  | 1 | TRS.1.1 FDD | | N/A | |
|  |  | 2 | TRS.1.1 TDD | | N/A | |
|  |  | 3 | TRS.1.2 TDD | | N/A | |
| IInitial BWP configuration |  | 1, 2, 3 | DLBWP.0.1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2, 3 | DLBWP.1.2 | | DLBWP.1.2 | |
| Active UL BWP configuration |  | 1, 2, 3 | ULBWP.1.2 | | ULBWP.1.2 | |
| RLM-RS |  | 1, 2, 3 | SSB | | SSB | |
| Note 2 | dBm/SCS | 1 | -98 | | | |
|  |  | 2 | -98 | | | |
|  |  | 3 | -95 | | | |
| Note 2 | dBm/15 kHz | 1 | -98 | | | |
|  |  | 2 |  | | | |
|  |  | 3 |  | | | |
|  | dB | 1 | 4 | -1.46 | -Infinity | -1.46 |
|  |  | 2 |  |  |  |  |
|  |  | 3 |  |  |  |  |
|  | dB | 1 | 4 | 4 | -Infinity | 4 |
|  |  | 2 |  |  |  |  |
|  |  | 3 |  |  |  |  |
| SS-RSRP Note 3 | dBm/SCS kHz | 1 | -94 | -94 | -Infinity | -94 |
|  |  | 2 | -94 | -94 | -Infinity | -94 |
|  |  | 3 | -91 | -91 | -Infinity | -91 |
| Io | dBm/9.36 MHz | 1 | -64.60 | -62.25 | --64.60 | -62.25 |
|  | dBm/9.36 MHz | 2 | -64.60 | -62.25 | --64.60 | -62.25 |
|  | dBm/38.16 MHz | 3 | -58.50 | -56.16 | --58.50 | -56.16 |
| Propagation Condition |  | 1, 2, 3 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

##### A.6.6.x3.5.3 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test.

UE is not allowed to cause interruption during intra-frequency measurement without gap.

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.

**----------------------END OF CHANGE 3----------------------------**

**----------------------START OF CHANGE 4----------------------------**

#### A.6.6.3.x1 SA NR - E-UTRAN event-triggered reporting in non-DRX in FR1

##### A.6.6.3.x1.1 Test Purpose and Environment

The purpose of this set of tests is to verify that if UE reports “*nogap-noncsg*” via *NeedForGapNCSG-InfoEUTRA-r17*, the UE makes correct event-triggered reporting of inter-RAT E-UTRAN measurements when operating in standalone (SA) operation with PCell in FR1. This test shall partly verify the cell search and measurement requirements in clause 9.4.8.

In each test there are two cells: Cell 1 and Cell 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN neighbour cell. In the measurement control information from the PCell it is indictated to the UE that event-triggered reporting with Event B2 (PCell becomes worse than threshold1 and inter RAT neighbour becomes better than threshold2) is to be used. Each test consists of two consecutive time periods, with durations T1 and T2, respectively. Prior to the start of time duration T1, the UE shall be fully synchronized to Cell 1. During T1, the UE shall not have any information on Cell 2.

Supported test configurations are shown in table A.6.6.3.x1.1-1. General test parameters are provided in Table A.6.6.3.x1.1-2 below. Test parameters for Cell 1 and Cell 2, valid for both time duration T1 and T2, are provided in Tables A.6.6.3.x1.1-3 and A.6.6.3.x1.1-4, respectively.

Table A.6.6.3.x1.1-1: Supported test configurations in SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode, LTE FDD |
| 2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode, LTE FDD |
| 3 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode, LTE FDD |
| 4 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode, LTE TDD |
| 5 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode, LTE TDD |
| 6 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode, LTE TDD |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Table A.6.6.3.x1.1-2: General test parameters for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| NR RF Channel Number |  | 1 | 1 NR carrier frequency is used in the test |
| LTE RF Channel Number |  | 1 | 1 LTE carrier frequency is used in the test |
| Channel Bandwidth | MHz | As specified in Tables A.6.6.3.x1.1-2 and A.6.6.3.x1.1-3. |  |
| Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbour cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
|  |  |  |  |
| Effective Measurement Window (EMW) Id |  | 0 | As specified in Table 9.4.8.2-1 |
| NR measurement quantity |  | SS-RSRP | Measurement quantity for Cell 1 |
| Inter-RAT E-UTRAN measurement quantity |  | RSRP | Measurement quantity for Cell 2 |
| b2-Threshold1 | dBm | Note 1 | SS-RSRP threshold for SS-RSRP measurement on cell1 for event B2 |
| b2-Threshold2EUTRA | dBm | -95 | E-UTRAN RSRP threshold for SS-RSRP measurement on cell1 for event B2 |
| Hysteresis | dB | 0 |  |
| TimeToTrigger | s | 0 |  |
| Filter coefficient |  | 0 | L3 filtering is not used |
| DRX |  | OFF | OFF |
| T1 | s | 5 |  |
| T2 | s | 5 |  |
| Note 1: Values are defined in Table A.6.6.3.x1.1-3 | | | |

Table A.6.6.3.x1.1-3: PCell specific test parameters for SA inter-RAT E-UTRA event triggered reporting in non-DRX with PCell in FR1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | | | Unit | Configuration | Cell 1 | |
|  | | |  |  | T1 | T2 |
| RF channel number | | |  | 1, 2, 3, 4, 5, 6 | 1 | |
| Duplex mode | | |  | 1, 2, 3 | FDD | |
|  | | |  | 4, 5, 6 | TDD | |
| TDD Configuration | | SCS=15 KHz |  | 2, 5 | TDDConf.1.1 | |
|  | | SCS=30 KHz |  | 3, 6 | TDDConf.2.1 | |
| BWchannel | | | MHz | 1, 4 | 10: NRB,c = 52 (FDD) | |
|  | | |  | 2, 5 | 10: NRB,c = 52 (TDD) | |
|  | | |  | 3, 6 | 40: NRB,c = 106 (TDD) | |
| PDSCH reference measurement channel | | |  | 1, 4 | SR.1.1 FDD | |
|  | | |  | 2, 5 | SR.1.1 TDD | |
|  | | |  | 3, 6 | SR.2.1 TDD | |
| RMSI CORSET reference channel | | |  | 1, 4 | CR.1.1 FDD | |
|  | | |  | 2, 5 | CR.1.1 TDD | |
|  | | |  | 3, 6 | CR.2.1 TDD | |
| Dedicated CORSET reference channel | | |  | 1, 4 | CCR.1.1 FDD | |
|  | | |  | 2, 5 | CCR.1.1 TDD | |
|  | | |  | 3, 6 | CCR.2.1 TDD | |
| BWP configurations | Initial DL BWP | |  | 1, 2, 3, 4, 5, 6 | DLBWP.0.1 | |
|  | Dedicated DL BWP | |  | 1, 2, 3, 4, 5, 6 | DLBWP.1.1 | |
|  | Initial UL BWP | |  | 1, 2, 3, 4, 5, 6 | ULBWP.0.1 | |
|  | Dedicated UL BWP | |  | 1, 2, 3, 4, 5, 6 | ULBWP.1.1 | |
| OCNG patternNote1 | | |  | 1, 2, 3, 4, 5, 6 | OP.1 | |
| SMTC configuration | | |  | 1, 2, 3, 4, 5, 6 | SMTC.1 | |
| SSB configuration | | |  | 1, 2, 4, 5 | SSB.1 FR1 | |
|  | | |  | 3, 6 | SSB.2 FR1 | |
| CSI-RS for tracking | | |  | 1, 4 | TRS.1.1 FDD | |
|  | 2, 5 | TRS.1.1 TDD | |
|  | 3, 6 | TRS.1.2 TDD | |
| b2-Threshold1 | | | dBm | 1, 2, 4, 5 | --96 | |
|  | | |  | 3, 6 | --93 | |
| EPRE ratio of PSS to SSS | | | dB | 1, 2, 3, 4, 5, 6 | 0 | |
| EPRE ratio of PBCH\_DMRS to SSS | | |  |  |  | |
| EPRE ratio of PBCH to PBCH\_DMRS | | |  |  |  | |
| EPRE ratio of PDCCH\_DMRS to SSS | | |  |  |  | |
| EPRE ratio of PDCCH to PDCCH\_DMRS | | |  |  |  | |
| EPRE ratio of PDSCH\_DMRS to SSS | | |  |  |  | |
| EPRE ratio of PDSCH to PDSCH\_DMRS | | |  |  |  | |
| EPRE ratio of OCNG DMRS to SSS | | |  |  |  | |
| EPRE ratio of OCNG to OCNG DMRS | | |  |  |  | |
| *Noc*Note2 | | | dBm/15 KHz | 1, 2, 3, 4, 5, 6 | -104 | |
| *Noc*Note2 | | | dBm/SCS | 1, 2, 4, 5 | -104 | |
|  | | |  | 3, 6 | -101 | |
| Ês/Noc | | | dB | 1, 2, 3, 4, 5, 6 | 16 | 0 |
| Ês/IotNote3 | | | dB | 1, 2, 3, 4, 5, 6 | 16 | 0 |
| SS-RSRPNote3 | | | dBm/SCS | 1, 2, 4, 5 | -88 | -104 |
|  | | |  | 3, 6 | -85 | -101 |
| SSB\_RPNote3 | | | dBm/SCS | 1, 2, 4, 5 | -88 | -104 |
|  | | |  | 3, 6 | -85 | -101 |
| IoNote3 | | | dBm/9.36 MHz | 1, 2, 4, 5 | -59.94 | -73.04 |
|  | | | dBm/38.16 MHz | 3, 6 | -53.84 | -66.93 |
| Propagation condition | | |  | 1, 2, 3, 4, 5, 6 | AWGN | |
| Antenna Configuration and Correlation Matrix | | |  | 1, 2, 3, 4, 5, 6 | 1x2 | |
| 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: Ês/Iot, SS-RSRP, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

Table A.6.6.3.x1.1-4: E-UTRAN neighbour cell specific test parameters for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Configuration | Cell 2 | |
|  |  |  | **T1** | **T2** |
| RF channel number |  | 1, 2, 3, 4, 5, 6 | 1 | |
| Duplex mode |  | 1, 2, 3 | FDD | |
|  |  | 4, 5, 6 | TDD | |
| TDD special subframe configurationNote1 |  | 4, 5, 6 | 6 | |
| TDD uplink-downlink configurationNote1 |  | 4, 5, 6 | 1 | |
| BWchannel | MHz | 1, 2, 3, 4, 5, 6 | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | |
| PDSCH parameters:  DL Reference Measurement ChannelNote2 |  | 1, 2, 3 | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | |
|  |  | 4, 5, 6 | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote2 |  | 1, 2, 3 | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | |
|  |  | 4, 5, 6 | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | |
| OCNG PatternsNote2 |  | 1, 2, 3 | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | |
|  |  | 4, 5, 6 | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | |
| PBCH\_RA | dB | 1, 2, 3, 4, 5, 6 | 0 | |
| PBCH\_RB |  |  |  | |
| PSS\_RA |  |  |  | |
| SSS\_RA |  |  |  | |
| PCFICH\_RB |  |  |  | |
| PHICH\_RA |  |  |  | |
| PHICH\_RB |  |  |  | |
| PDCCH\_RA |  |  |  | |
| PDCCH\_RB |  |  |  | |
| PDSCH\_RA |  |  |  | |
| PDSCH\_RB |  |  |  | |
| OCNG\_RANote3 |  |  |  | |
| OCNG\_RBNote3 |  |  |  | |
| NocNote4 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -104 | |
| Ês/Noc | dB | 1, 2, 3, 4, 5, 6 | -Infinity | 17 |
| Ês/IotNote5 | dB | 1, 2, 3, 4, 5, 6 | -Infinity | 17 |
| RSRPNote5 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -Infinity | -87 |
| SCH\_RPNote5 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -Infinity | -87 |
| IoNote5 | dBm/9MHz | 1, 2, 3, 4, 5, 6 | -73.21+10log (NRB,c /50) | -56.12+10log (NRB,c /50) |
| Propagation Condition |  | 1, 2, 3, 4, 5, 6 | AWGN | |
| Antenna Configuration and Correlation Matrix |  | 1, 2, 3, 4, 5, 6 | 1x2 | |
| Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [23].  Note 2: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [15] respectively.  Note 3: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 5: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | |

##### A.6.6.3.x1.2 Test Requirements

The UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 3.84s from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event-triggered measurement reports as long as the reporting criteria are not fulfilled.

During the T1 and T2, UE shall be able to report ACK/NACK for all slots with PDCCH/PDSCH on PCell excluding those symbles as defined in 9.4.8.3.5 or 9.4.8.4.5.

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

#### A.6.6.3.x2 SA NR - E-UTRAN event-triggered reporting without gap under non-DRX in FR1

##### A.6.6.3.x2.1 Test Purpose and Environment

The purpose of this set of tests is to verify that the UE makes correct event-triggered reporting of inter-RAT E-UTRAN measurements without gap as there are vacant RF chains available for UE measurements when operating in standalone (SA) operation with PCell in FR1. This test shall partly verify the cell search and measurement requirements in Clauses 9.4.8, and also verify the scheduling availability during inter-RAT measurement without gap in clause 9.4.8.3.5.

The serving frequency and the target frequency should be selected such that UE reports ‘*nogap-noncsg*’ via *NeedForGapNCSG-InfoEUTRA-r17* for the target frequency given the serving frequency and ‘[*32-6 to supportEMWconifugation*]’.

##### A.6.6.3.x2.2 Test parameters

In each test there are two cells: Cell 1 and Cell 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. In the measurement control information from the PCell it is indictated to the UE that event-triggered reporting with Event B2 (PCell becomes worse than threshold1 and inter RAT neighbour becomes better than threshold2) is to be used. Each test consists of two consecutive time periods, with durations T1 and T2, respectively. Prior to the start of time duration T1, the UE shall be fully synchronized to Cell 1. During T1, the UE shall not have any information on Cell 2.

Supported test configurations are given in table Table A.6.6.3.2.1-1 and for EMW configuration in Table A.6.6.3.x2.2-1 . General test parameters are provided in Table Table A.6.6.3.2.1-1. Test parameters for Cell 1 and Cell 2, valid for both time duration T1 and T2, are provided in Tables Table A.6.6.3.2.1-3 and Table A.6.6.3.2.1-4, respectively.

[Table A.6.6.3.x2.2-1: EMW confiugation test parameters for SA inter-RAT E-UTRA without gap event triggered reporting in non-DRX with PCell in FR1]

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Configuration | EMW confiutation |
|  |  |  |  |
| EMW configuration |  | 1, 2, 3, 4, 5, 6 | TBD |

[*Editor notes: whether the other test with EMW configured which is overlapped the measurement gap can be FFS*]

##### A.6.6.3.x2.3 Test Requirements

The actual overall measurement delay requiremetns can refere to the requirements in A.6.6.3.1.2. And during T1 and T2, for the two subtests regarding to EMW conifuation, UE shall or not send HARQ ACK/NACK for the corresponding PDSCH scheduled in PCell based on the requirements defined in 9.4.8.3.5.

#### A.6.6.3.x3 SA NR - E-UTRAN event-triggered reporting in non-DRX in FR1 for UE capable of inter-RAT EUTRAN measurement without gap when CRS is contained within UE’s active DL BWP

##### A.6.6.3.x3.1 Test Purpose and Environment

The purpose of this set of tests is to verify that the UE which supports inter-RAT EUTRAN measurement without gap when CRS is contained within UE’s active DL BWP makes correct event-triggered reporting of inter-RAT E-UTRAN measurements when operating in standalone (SA) operation with PCell in FR1. This test shall partly verify the cell search and measurement requirements in Clauses 9.4.8, and also verify the scheduling availability during inter-RAT EUTRAN in clause 9.4.8.3.5 and 9.4.8.4.5.

In each test there are two cells: Cell 1 and Cell 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. The CRS of cell 2 is completely within UE’s active BWP BW.

In the measurement control information from the PCell, it is indictated to the UE that event-triggered reporting with Event B2 (PCell becomes worse than threshold1 and inter RAT neighbour becomes better than threshold2) is to be used. Each test consists of two consecutive time periods, with durations T1 and T2, respectively. Prior to the start of time duration T1, the UE shall be fully synchronized to Cell 1. During T1, the UE shall not have any information on Cell 2.

Supported test configurations are shown in table A.6.6.3.x3.1-1. General test parameters are provided in Table A.6.6.3.x3.1-2 below. Test parameters for Cell 1 and Cell 2, valid for both time duration T1 and T2, are provided in Tables A.6.6.3.x3.1-3 and A.6.6.3.x3.1-4, respectively.

Table A.6.6.3.x3.1-1: Supported test configurations in SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode, LTE FDD |
| 2 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode, LTE FDD |
| 3 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode, LTE FDD |
| 4 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode, LTE TDD |
| 5 | NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode, LTE TDD |
| 6 | NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode, LTE TDD |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Table A.6.6.3.x3.1-2: General test parameters for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| NR RF Channel Number |  | 1 | 1 NR carrier frequency is used in the test |
| LTE RF Channel Number |  | 1 | 1 LTE carrier frequency is used in the test |
| Channel Bandwidth | MHz | As specified in Tables A.6.6.3.1.1-2 and A.6.6.3.1.1-3. |  |
| Active cell |  | Cell 1 | Cell 1 is on RF channel number 1 |
| Neighbour cell |  | Cell 2 | Cell 2 is on RF channel number 2 |
| EMW periodicity | ms | 40 |  |
| EMW duration | ms | 5 |  |
| NR measurement quantity |  | SS-RSRP | Measurement quantity for Cell 1 |
| Inter-RAT E-UTRAN measurement quantity |  | RSRP | Measurement quantity for Cell 2 |
| b2-Threshold1 | dBm | Note 1 | SS-RSRP threshold for SS-RSRP measurement on cell1 for event B2 |
| b2-Threshold2EUTRA | dBm | -95 | E-UTRAN RSRP threshold for SS-RSRP measurement on cell1 for event B2 |
| Hysteresis | dB | 0 |  |
| TimeToTrigger | s | 0 |  |
| Filter coefficient |  | 0 | L3 filtering is not used |
| DRX |  | OFF | OFF |
| T1 | s | 5 |  |
| T2 | s | 5 |  |
| Note 1: Values are defined in Table A.6.6.3.1.1-3 | | | |

Table A.6.6.3.x3.1-3: PCell specific test parameters for SA inter-RAT E-UTRA event triggered reporting in non-DRX with PCell in FR1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | | | Unit | Configuration | Cell 1 | |
|  | | |  |  | T1 | T2 |
| RF channel number | | |  | 1, 2, 3, 4, 5, 6 | 1 | |
| Duplex mode | | |  | 1, 4 | FDD | |
|  | | |  | 2, 3, 5, 6 | TDD | |
| TDD Configuration | | SCS=15 KHz |  | 2, 5 | TDDConf.1.1 | |
|  | | SCS=30 KHz |  | 3, 6 | TDDConf.2.1 | |
| BWchannel | | | MHz | 1, 4 | 10: NRB,c = 52 (FDD) | |
|  | | |  | 2, 5 | 10: NRB,c = 52 (TDD) | |
|  | | |  | 3, 6 | 40: NRB,c = 106 (TDD) | |
| PDSCH reference measurement channel | | |  | 1, 4 | SR.1.1 FDD | |
|  | | |  | 2, 5 | SR.1.1 TDD | |
|  | | |  | 3, 6 | SR.2.1 TDD | |
| RMSI CORSET reference channel | | |  | 1, 4 | CR.1.1 FDD | |
|  | | |  | 2, 5 | CR.1.1 TDD | |
|  | | |  | 3, 6 | CR.2.1 TDD | |
| Dedicated CORSET reference channel | | |  | 1, 4 | CCR.1.1 FDD | |
|  | | |  | 2, 5 | CCR.1.1 TDD | |
|  | | |  | 3, 6 | CCR.2.1 TDD | |
| BWP configurations | Initial DL BWP | |  | 1, 2, 3, 4, 5, 6 | DLBWP.0.1 | |
|  | Dedicated DL BWP | |  | 1, 2, 3, 4, 5, 6 | DLBWP.1.1 | |
|  | Initial UL BWP | |  | 1, 2, 3, 4, 5, 6 | ULBWP.0.1 | |
|  | Dedicated UL BWP | |  | 1, 2, 3, 4, 5, 6 | ULBWP.1.1 | |
| OCNG patternNote1 | | |  | 1, 2, 3, 4, 5, 6 | OP.1 | |
| SMTC configuration | | |  | 1, 2, 3, 4, 5, 6 | SMTC.1 | |
| SSB configuration | | |  | 1, 2, 4, 5 | SSB.1 FR1 | |
|  | | |  | 3, 6 | SSB.2 FR1 | |
| CSI-RS for tracking | | |  | 1, 4 | TRS.1.1 FDD | |
|  | 2, 5 | TRS.1.1 TDD | |
|  | 3, 6 | TRS.1.2 TDD | |
| b2-Threshold1 | | | dBm | 1, 2, 4, 5 | - 96 | |
|  | | |  | 3, 6 | - 93 | |
| EPRE ratio of PSS to SSS | | | dB | 1, 2, 3, 4, 5, 6 | 0 | |
| EPRE ratio of PBCH\_DMRS to SSS | | |  |  |  | |
| EPRE ratio of PBCH to PBCH\_DMRS | | |  |  |  | |
| EPRE ratio of PDCCH\_DMRS to SSS | | |  |  |  | |
| EPRE ratio of PDCCH to PDCCH\_DMRS | | |  |  |  | |
| EPRE ratio of PDSCH\_DMRS to SSS | | |  |  |  | |
| EPRE ratio of PDSCH to PDSCH\_DMRS | | |  |  |  | |
| EPRE ratio of OCNG DMRS to SSS | | |  |  |  | |
| EPRE ratio of OCNG to OCNG DMRS | | |  |  |  | |
| *Noc*Note2 | | | dBm/15 KHz | 1, 2, 3, 4, 5, 6 | -104 | |
| *Noc*Note2 | | | dBm/SCS | 1, 2, 4, 5 | -104 | |
|  | | |  | 3, 6 | -101 | |
| Ês/Noc | | | dB | 1, 2, 3, 4, 5, 6 | 16 | 0 |
| Ês/IotNote3 | | | dB | 1, 2, 3, 4, 5, 6 | 16 | 0 |
| SS-RSRPNote3 | | | dBm/SCS | 1, 2, 4, 5 | -88 | -104 |
|  | | |  | 3, 6 | -85 | -101 |
| SSB\_RPNote3 | | | dBm/SCS | 1, 2, 4, 5 | -88 | -104 |
|  | | |  | 3, 6 | -85 | -101 |
| IoNote3 | | | dBm/9.36 MHz | 1, 2, 4, 5 | -59.94 | -73.04 |
|  | | | dBm/38.16 MHz | 3, 6 | -53.84 | -66.93 |
| Propagation condition | | |  | 1, 2, 3, 4, 5, 6 | AWGN | |
| Antenna Configuration and Correlation Matrix | | |  | 1, 2, 3, 4, 5, 6 | 1x2 | |
| 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: Ês/Iot, SS-RSRP, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

Table A.6.6.3.x3.1-4: E-UTRAN neighbour cell specific test parameters for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Configuration | Cell 2 | |
|  |  |  | **T1** | **T2** |
| RF channel number |  | 1, 2, 3, 4, 5, 6 | 2 | |
| Duplex mode |  | 1, 2, 3 | FDD | |
|  |  | 4, 5, 6 | TDD | |
| TDD special subframe configurationNote1 |  | 4, 5, 6 | 6 | |
| TDD uplink-downlink configurationNote1 |  | 4, 5, 6 | 1 | |
| BWchannel | MHz | 1, 2, 3, 4, 5, 6 | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | |
| PDSCH parameters:  DL Reference Measurement ChannelNote2 |  | 1, 2, 3 | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | |
|  |  | 4, 5, 6 | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote2 |  | 1, 2, 3 | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | |
|  |  | 4, 5, 6 | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | |
| OCNG PatternsNote2 |  | 1, 2, 3 | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | |
|  |  | 4, 5, 6 | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | |
| PBCH\_RA | dB | 1, 2, 3, 4, 5, 6 | 0 | |
| PBCH\_RB |  |  |  | |
| PSS\_RA |  |  |  | |
| SSS\_RA |  |  |  | |
| PCFICH\_RB |  |  |  | |
| PHICH\_RA |  |  |  | |
| PHICH\_RB |  |  |  | |
| PDCCH\_RA |  |  |  | |
| PDCCH\_RB |  |  |  | |
| PDSCH\_RA |  |  |  | |
| PDSCH\_RB |  |  |  | |
| OCNG\_RANote3 |  |  |  | |
| OCNG\_RBNote3 |  |  |  | |
| NocNote4 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -104 | |
| Ês/Noc | dB | 1, 2, 3, 4, 5, 6 | -Infinity | 17 |
| Ês/IotNote5 | dB | 1, 2, 3, 4, 5, 6 | -Infinity | 17 |
| RSRPNote5 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -Infinity | -87 |
| SCH\_RPNote5 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -Infinity | -87 |
| IoNote5 | dBm/9MHz | 1, 2, 3, 4, 5, 6 | -73.21+10log (NRB,c /50) | -56.12+10log (NRB,c /50) |
| Propagation Condition |  | 1, 2, 3, 4, 5, 6 | AWGN | |
| Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [23].  Note 2: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [15] respectively.  Note 3: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 5: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | |

##### A.6.6.3.x3.2 Test Requirements

The UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 3.84s from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

During T2, UE does not cause interruption due to inter-RAT EUTRAN measurement without gap.

The UE shall not send event-triggered measurement reports as long as the reporting criteria is not fulfilled.

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

**----------------------END OF CHANGE 4----------------------------**

**----------------------START OF CHANGE 5----------------------------**

### A.7.6.x1 SA event triggered reporting tests with joint operation of concurrent gaps and pre-configured gaps

#### A.7.6.x1.1 SA event triggered reporting test for FR2 with one pre-configured gap and one measurement gap

##### A.7.6.x1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event with with one pre-configured gap and one measurement gap for SSB-based measurements. This test will partly verify the SA NR cell search requirements in clause 9.2.5 and 9.3.4, pre-configured gap activation delay in clause 8.17 and measurement gap collision handling in clause 9.1.12.

In this test, there are three cells: NR cell 1 as PCell in FR2 on NR RF channel 1, NR cell 2 as intra-frequency neighbour cell in FR2 on NR RF channel 1, and NR cell 3 as inter-frequency neighbour cell in FR2 on NR RF channel 2.

Two measurement gaps with pattern configuration # 13 and 14 as defined in Table A.7.6.x1.1.1-2 are provided for UE. The measurement object #1 for NR RF channel 1 is associated with MG#1, and measurement object #2 for NR RF channel 2 is associated with MG#2. MG#1 is a pre-configured measurement gap, and with higher priority than MG#2.

Before the test starts,

UE is connected to Cell 1 (PCell) on radio channel 1 (PCC).

UE is configured with 2 different UE-specific bandwidth parts for Cell 1 (PCell), BWP-1 and BWP-2, before starting the test.

BWP-1 includes bandwidth of the initial DL BWP and SSB with the Pre-MG status set to ‘deactivated’ (*preConfGapStatus* of the pre-MG on BWP-1 is set to ‘0’).

BWP-2 does not include bandwidth of the initial DL BWP and SSB with the Pre-MG status set to ‘activated’ (*preConfGapStatus* of the pre-MG on BWP-2 is set to ‘1’).

UE is indicated in *firstActiveDownlinkBWP-Id* that the active DL BWPis BWP-1 in PCell.

The TE schedules continuous DL data on PCell throughout the test.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of 2 successive time periods, with durations of T1 and T2, respectively. Before the test starts, the UE shall not have any timing information of NR Cell 2 or NR Cell 3.

During T1, UE active DL BWP is BWP-1, and the pre-configured gap (MG#1) is deactivated. Cell 3 is switched ON from the beginning of T1, and UE is supposed to search Cell 3 in MG#2 and no occasion of MG#2 should be dropped due to collision with MG#1.

The time period T2 starts when a DCI format 1\_1 command for PCell DL BWP switch, sent from the test equipment to the UE, is received at the UE side in PCell’s slot # denoted *i*. The UE shall switch its DL active BWP from BWP-1 to BWP-2, and the pre-configured gap is activated. Cell 2 is switched ON from the beginning of T2, and UE is supposed to search Cell 2 in MG#1 and no occasion of MG#1 should be dropped due to collision with MG#2.

Supported test configurations are shown in table A.7.6.x1.1.1-1. The general and cell specific test parameters are given in Tables A.7.6.x1.1.1-2, and A.7.6.x1.1.1-3.

Table A.7.6.x1.1.1-1 SA event triggered reporting tests without SSB index reading for FR2 with fully non-overlapping concurrent MGs for SSB-based inter-frequency measurements

|  |  |
| --- | --- |
| Config | Description |
| 1 | 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |

Table A.7.6.x1.1.1-2: General test parameters for SA inter-frequency event triggered reporting for FR2 with fully non-overlapping concurrent MGs for SSB-based inter-frequency measurements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| NR RF Channel Number |  | Config 1 | 1, 2 | Two FR2 NR carrier frequencies is used. |
| Active cell |  | Config 1 | NR Cell 1 (PCell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1 | NR Cell 2 and 3 | NR Cell 2 is on NR RF channel number 1. NR Cell 3 is on NR RF channel number 2. |
| Gap Pattern Id |  | Config 1 | 14 for MG#1 (80ms MGRP)  13 for MG#2 (40ms MGRP) | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1 | 79 for MG#1  4 for MG#2 |  |
| SMTC configuration |  | Config 1 | SMTC.1 for MO#1  SMTC.7 for MO#2 | As specified in clause A.3.11 |
| offsetMO | dB | Config 1 | 16 | Applied to NR Cell 2 and 3 measurement object |
| A3-Offset | dB | Config 1 | -11 |  |
| Hysteresis | dB | Config 1 | 0 |  |
| CP length |  | Config 1 | Normal |  |
| TimeToTrigger | s | Config 1 | 0 |  |
| Filter coefficient |  | Config 1 | 0 | L3 filtering is not used |
| DRX |  | Config 1 | OFF | DRX is not used |
| Time offset between Cell 1 and Cell 2 |  | Config 1 | 3μs | Cell 2 is synchronous to Cell 1 |
| Time offset between Cell 1 and Cell 3 |  | Config 1 | 5ms | Cell 3 is asynchronous to Cell 1 |
| T1 | s | Config 1 | 5.2 |  |
| T2 | s | Config 1 | 6.5 |  |

Table A.7.6.x1.1.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR2 with fully non-overlapping concurrent MGs for SSB-based inter-frequency measurements

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | | Cell 2 | | **Cell 3** | | |
|  |  |  | T1 | | T2 | T1 | T2 | T1 | | T2 |
| AoA setup |  | Config 1 | Setup 3 as specified in clause A.3.15 | | | | | | | |
|  |  |  | AoA1 | | | AoA2 | | AoA2 | | |
| Beam AssumptionNote 4 |  | Config 1 | Rough | | | Rough | | Rough | | |
| NR RF Channel Number |  | Config 1 | 1 | | | 1 | | 2 | | |
| Duplex mode |  | Config 1 | TDD | | | TDD | | TDD | | |
| TDD configuration |  | Config 1 | TDDConf.3.1 | | | TDDConf.3.1 | | TDDConf.3.1 | | |
| BWchannel | MHz | Config 1 | 100: NRB,c = 66 | | | 100: NRB,c = 66 | | 100: NRB,c = 66 | | |
| Data RBs allocated |  | Config 1 | 66 | | | 66 | | 66 | | |
| BWP-1 Configuration |  | Config 1 | DLBWP.1.6  ULBWP.1.6 | | | N/A | | N/A | | |
| BWP-2 Configuration |  | Config 1 | DLBWP.1.5  ULBWP.1.5 | | | N/A | | N/A | | |
| SSB configuration |  |  | SSB.3 FR2 | | | SSB.7 FR2 | | SSB.3 FR2 | | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) |  | Config 1 | OP.1 | | | N/A | | N/A | | |
| PDSCH Reference measurement channel |  | Config 1 | SR.3.1 TDD | | | N/A | | N/A | | |
| CORESET Reference Channel |  | Config 1 | CR.3.1 TDD | | | N/A | | N/A | | |
| TRS configuration |  | Config 1 | TRS.2.1 TDD | | | N/A | | N/A | | |
| PDSCH/PDCCH TCI state |  | Config 1 | TCI.State.2 | | | N/A | | N/A | | |
| EPRE ratio of PSS to SSS |  |  |  | | |  | |  | | |
| EPRE ratio of PBCH DMRS to SSS |  |  |  | | |  | |  | | |
| EPRE ratio of PBCH to PBCH DMRS |  |  |  | | |  | |  | | |
| EPRE ratio of PDCCH DMRS to SSS |  |  |  | | |  | |  | | |
| EPRE ratio of PDCCH to PDCCH DMRS |  | Config 1 | 0 | | | 0 | | 0 | | |
| EPRE ratio of PDSCH DMRS to SSS |  |  |  | | |  | |  | | |
| EPRE ratio of PDSCH to PDSCH |  |  |  | | |  | |  | | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) |  |  |  | | |  | |  | | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) |  |  |  | | |  | |  | | |
| Ês | dBm/SCS | Config 1 | -87 | -87 | | -Infinity | -87 | -87 | -87 | |
| SSB\_RP Note 2 | dBm/SCS Note3 | Config 1 | -87 | -87 | | -Infinity | -87 | -87 | -87 | |
| BB Note 5 | dB | Config 1 | 1.89 | 1.89 | | -Infinity | 1.89 | 1.89 | 1.89 | |
| IoNote 2 | dBm/95.04 MHz Note3 | Config 1 | -58.01 | -58.01 | | -Infinity | -58.01 | 58.01 | -58.01 | |
| Propagation Condition |  | Config 1 | AWGN | | | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: SSBRP, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: Equivalent power received by an antenna with 0 dBi gain at the centre of the quiet zone  Note 4: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation  Note 5: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 38.101-2 [19], and an allowance of 1dB for UE multi-band relaxation factor ΔMBS from TS 38.101-2 [19] Table 6.2.1.3-4. | | | | | | | | | | |

##### A.7.6.x1.1.2 Test Requirements

During T1, the UE shall be able to receive PDSCH and report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with the MG#1 occasions. The UE shall send one Event A3 triggered measurement report for Cell 3, with a measurement reporting delay less than X ms from the beginning of time period T1, where X is

5120 for UE supporting power class 1 and 5, or

3200 for UE supporting other power class.

X is derived based on the requirements for inter-frequency measurement in clause 9.3.4 and 9.3.5.

During T2, the UE is not required to report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with the MG#1 occasions, starting from the 1st complete MG#1 occasion after the beginning of PCell’s DL slot (*i+TBWPswitchDelay*) + 5ms as defined in clause 8.19.2. The UE shall send one Event A3 triggered measurement report for Cell 2, with a measurement reporting delay less than Y ms from the beginning of time period T2, where Y is

6480 for UE supporting power class 1 and 5, or

3920 for UE supporting other power class.

Y is derived based on the requirements for intra-frequency measurement in clause 9.2.6 plus 80ms, considering that the frist MG#1 occasion in T2 may collide with the pre-configured gap activation delay.

The UE is not required to report SSB time index. 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.7.6.x2.1 Inter-frequency measurement test with SA event triggered reporting tests: with autonomous activation/deactivation of Pre-MGs in FR2

##### A.7.6.x2.1.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event with autonomous activation/deactivation of Pre-MGs within FR2 concurrent gaps. This test will partly verify the TDD inter-frequency cell search requirements in clause 9.2.6.and 9.3.4. Also, this test will also jointly verify pre-configured measurement gap activation/deactivation delay in clause 8.19.2.

##### A.7.6.x2.1.2 Test parameters

Two cells are deployed in the test, which are FR2 PCell (Cell 1) in FR1 on NR RF channel 1 and a neighbour cell (Cell 2) in FR2 on NR RF channel 2. The supported test configurations are shown in Table A.7.6.x2.1.2-1. The test parameters for the Cell 1 and Cell 2 are given in Table A.7.6.x2.1.2-2, A.7.6.x2.1.2-3 and A.7.6.x21.2-4 below.

Two pre-configured measurement gaps with same pattern (# 13) but different offset as defined in Table A.7.6.x2.1.1-2 are provided for UE. But the The measurement object for NR RF channel 1 is associated with MG#1, and measurement object for NR RF channel 2 is associated with MG#2

In the measurement control information, two measurement object is configured for the frequency of the PCell and neihghbour cell, and it is indicated to the UE that event-triggered reporting with Event A3 is used.

Before the test starts,

UE is connected to Cell 1 (PCell) on radio channel 1 (PCC).

UE is configured with 2 different UE-specific bandwidth parts for Cell 1 (PCell), BWP-1 and BWP-2, before starting the test.

BWP-1 includes bandwidth of the initial DL BWP and SSBs.

BWP-2 does not include bandwidth of the initial either switched DL BWP and SSBs.

UE is indicated in *firstActiveDownlinkBWP-Id* that the active DL BWPis BWP-1 in PCell.

The TE schedules continuous DL data on PCell throughout the test.

The test consists of 3 successive time periods, with durations of T1, T2 and T3, respectively.

During time period T1, BWP-1 is the active BWP. The Pre-MG#1 is expected to be deactivated and the Pre-MG#2 is expected to be activated. UE shall be able to measure Cell1 without gap but Cell2 with the activated Pre-MG#2.

The time period T2 starts when a DCI format 1\_1 command for PCell DL BWP switch, sent from the test equipment to the UE, is received at the UE side in PCell’s slot # denoted *i*.

During time period T3, BWP-2 is the active BWP. Both Pre-MG#1 and Pre-MG#2 expected to be activated. UE shall be able to measure Cell1 and Cell2 with the activated Pre-MG#1 and Pre-MG#2 respectively.

Table A.7.6.x2.1.2-1: supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |

Table A.7.6.x2.1.2-2: General test parameters for intra-frequency event triggered reporting with autonomous activation/deactivation of Pre-MG

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| Active cell |  | Config 1 | PCell (Cell 1) |  |
| Neighbour cell |  | Config 1 | Cell 2 | Cells to be identified. |
| RF Channel Number |  | Config 1 | 1: Cell 1 , 2: Cell 2 |  |
| SMTC configuration |  | Config 1 | SMTC.1 |  |
| A4-Threshold | dBm | Config 1 | -120 |  |
| CP length |  | Config 1 | Normal |  |
| Hysteresis | dB | Config 1 | 0 |  |
| Time To Trigger | s | Config 1 | 0 |  |
| Filter coefficient |  | Config 1 | 0 | L3 filtering is not used |
| DRX |  | Config 1 | OFF |  |
| Gap Pattern Id |  | Config 1 | 13 | For both pre-conifgured gaps |
| Measurement gap offset | ms | Config 1 | 4 for MeasGapId #1  19 for MeasGapId #2 | No overlapping cases |
| Time offset between serving and neighbour cells |  | Config 1 | 3 μs | Synchronous cells |
| T1 | s | Config 1 | 5 |  |
| T2 | s | Config 1 | 0.2 |  |
| T3 | s | Config 1 | 10.4 for PC1 and PC5; 6.5 for other PC |  |

Table A.7.6.x2.1.2-3: NR Cell specific test parameters for intra-frequency event triggered reporting with autonomous activation/deactivation of Pre-MG

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Cell 1 | | | Cell 2 | | |
|  |  | T1 | T2 | T3 | T1 | T2 | T3 |
| TDD configuration |  | TDDConf.3.1 | | | TDDConf.3.1 | | |
| BWchannel | MHz | 100: NRB,c = 66 | | | 100: NRB,c = 66 | | |
| Data RBs allocated |  | 24 | | | 24 | | |
| Intial BWP configuration |  | DLBWP.0.1  ULBWP.0.1 | | | DLBWP.0.1  ULBWP.0.1 | | |
| BWP-1 Configuration |  | DLBWP.1.6  ULBWP.1.6 | | | N/A | | |
| BWP-2 Configuration |  | DLBWP.1.5  ULBWP.1.5 | | | N/A | | |
| RLM-RS |  | CSI-RS | | | N/A | | |
| PDSCH RMC configuration |  | SR.3.2 TDD | | | N/A | | |
| RMSI CORESET RMC configuration |  | CR.3.1 TDD | | | N/A | | |
| Dedicated CORESET RMC configuration |  | CCR.3.1 TDD | | | N/A | | |
| TRS configuration |  | TRS.2.1 TDD | | | N/A | | |
| PDSCH/PDCCH TCI states |  | TCI.State.2 | | | N/A | | |
| PDSCH/PDCCH subcarrier spacing | kHz | 120 | | | 120 | | |
| OCNG Patterns |  | OP.5 | | | N/A | | |
| cellIndividualOffset | dB | N/A | | | 16 | | |
| SSB |  | SSB.1 FR2 | | | SSB.7 FR2 | | |
| Propagation Condition |  | AWGN | | | AWGN | | |

Table A.7.6.x2.1.2-4: NR OTA Cell specific test parameters for intra-frequency event triggered reporting with automous activation/deactivation of Pre-MG

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Cell 1 | | | Cell 2 | | |
| T1 | T2 | T3 | T1 | T2 | T3 |
| AoA setup |  | Setup 3 defined in A.3.15.3 | | | | | |
| AoA1 | | | AoA2 | | |
| Beam assumptionNote 3 |  | Rough | | | Rough | | |
| Es | dBm/SCS | -89 | -89 | -89 | -infinity | -89 | -89 |
| BB Note 4 | dB | -0.12 | -0.12 | -0.12 | -Infinity | -0.12 | -0.12 |
| SSB\_RP | dBm/SCS | -89 | -89 | -89 | -infinity | -89 | -89 |
|  | dBm/95.04MHz | -64.41 | -64.41 | -64.41 | -Infinity | -64.41 | -64.41 |
| Time multiplexing of the downlink transmissions from each AoA | | Defined in Figure A.7.6.1.1.1-1 | | | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Es/Iot, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation  Note 4: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 38.101-2 [19], and an allowance of 1dB for UE multi-band relaxation factor ΔMBP from TS 38.101-2 [19] Table 6.2.1.3-4. | | | | | | | |

##### A.7.6.x2.1.3 Test Requirements

During T1, the UE shall be able to receive PDSCH and report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with the Pre-MG occasions.

During T2 and T3, the UE shall not report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots overlapped with the Pre-MG occasions, starting from the 1st complete Pre-MG occasion after the beginning of PCell’s DL slot (*i+TBWPswitchDelay*) + 5ms as defined in clause 8.19.5.

The UE shall send one Event A4 triggered measurement report for measurements on cell 2, with a measurement reporting delay less than Y ms from the beginning of time period T3, where Y is

- 102400s for a UE supporting power class 1 and 5,

- 6400s for a UE supporting power class 2, 3 and 4

The UE is not required to read the neighbour cell SSB index in this test.

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.

**----------------------END OF CHANGE 5----------------------------**

**----------------------START OF CHANGE 6----------------------------**

### A.7.6.x2 SA event triggered reporting tests with concurrent gaps and NCSG

#### A.7.6.x2.1 SA event triggered reporting tests For FR2 with concurrent measurement gaps and NCSG without SSB time index detection when DRX is not used (PCell in FR2)

##### A.7.6.x2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event for each neighbour cell. This test will partly verify the SA inter-frequency NR cell search requirements and collision handling between partially-partial overlapped concurrent gaps and NCSG in clause 9.1.13.

In this test, there are three cells: NR cell 1 as PCell in FR2 on NR RF channel 1, NR cell 2 as neighbour cell in FR2 on NR RF channel 2 and NR cell 3 as another neighbour cell in FR2 on NR RF channel 3. The test parameters and configurations are given in Tables A.7.6.x2.1.1-1, A.7.6.x2.1.1-2, and A.7.6.x2.1.1-3.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

During T2, the UE is continuously scheduled with data on the PCell when measuring within NCSG.

One measurement gap and one NCSG are configured to UE with measurement gap pattern #13 and NCSG pattern #14 respectively. Measurement gap with pattern #13 is associated with inter-frequency measurement on NR cell 2, and NCSG with pattern #14 is associated with inter-frequency measurement on NR cell 3.

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 NR cell 2 and NR cell 3.

Supported test configurations are shown in table A.7.6.x2.1.1-1.

Table A.7.6.x2.1.1-1 SA event triggered reporting tests without SSB index reading for FR2-FR2

|  |  |
| --- | --- |
| Config | Description |
| 1 | 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
|  | |

Table A.7.6.x2.1.1-2: General test parameters for SA inter-frequency event triggered reporting for FR2 partially overlapped concurrent gap and NCSG for SSB-based measurements without SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| NR RF Channel Number |  | Config 1 | 1, 2, 3 | Three FR2 NR carrier frequencies are used. |
| Active cell |  | Config 1 | NR cell 1 (PCell) | NR Cell 1 is on NR RF channel number 1. |
| 1st Neighbour cell |  | Config 1 | NR cell 2 | NR cell 2 is on NR RF channel number 2. |
| 2nd Neighbour cell |  | Config 1 | NR cell 3 | NR cell 3 is on NR RF channel number 3. |
| Measurement Gap Pattern Id |  | Config 1 | 13 | As specified in clause 9.1.2-1. |
| NCSG Pattern Id |  | Config 1 | 14 | As specified in clause 9.1.2-1. |
| Measurement Gap offset | ms | Config 1 | 39 |  |
| NCSG offset | ms | Config 1 | 79 |  |
| Measurement Gap priority |  | Config 1 | 2 | Second level priority |
| NCSG priority |  | Config 1 | 1 | Highest priority |
| SMTC-SSB parameters |  | Config 1 | SSB.3 FR2 | As specified in clause A.3.10.2 |
| offsetMO | dB | Config 1 | 16 | Applied to NR Cell 2 and NR Cell 3 measurement objects |
| A3-Offset | dB | Config 1 | -11 |  |
| Hysteresis | dB | Config 1 | 0 |  |
| CP length |  | Config 1 | Normal |  |
| TimeToTrigger | s | Config 1 | 0 |  |
| Filter coefficient |  | Config 1 | 0 | L3 filtering is not used |
| DRX |  | Config 1 | OFF | DRX is not used |
| Time offset between serving and neighbour cells |  | Config 1 | 3μs | Synchronous cells. |
| T1 | s | Config 1 | 5 |  |
| T2 | s | Config 1 | 5.2 for PC1 and PC5; 3.5 for other PC |  |

Table A.7.6.x2.1.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR2 without SSB time index detection

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Cell 1 | | Cell 2 | | Cell 3 | |
|  | |  |  | T1 | T2 | T1 | T2 | T1 | T2 |
| AoA setup | |  | Config 1 | Setup 3 as specified in clause A.3.15 | | | | | |
|  | |  |  | AoA1 | | AoA2 | | AoA3 | |
| Beam AssumptionNote 7 | |  | 1,2 | Rough | | Rough | | Rough | |
| NR RF Channel Number | |  | Config 1 | 1 | | 2 | | 3 | |
| Duplex mode | |  | Config 1 | TDD | | TDD | | TDD | |
| TDD configuration | |  | Config 1 | TDDConf.3.1 | | TDDConf.3.1 | | TDDConf.3.1 | |
| BWchannel | | MHz | Config 1 | 100: NRB,c = 66 | | 100: NRB,c = 66 | | 100: NRB,c = 66 | |
| Data RBs allocated | |  | Config 1 | 66 | | 66 | | 66 | |
| BWP BW | | MHz | Config 1 | 100: NRB,c = 66 | | 100: NRB,c = 66 | | 100: NRB,c = 66 | |
| BWP configuration | Initial DL BWP |  | Config 1 | DLBWP.0.1 | | N/A | | N/A | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | N/A | | N/A | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | N/A | | N/A | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | N/A | | N/A | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1 | OP.1 | | OP.1 | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1 | SR.3.1 TDD | | - | | - | |
| CORESET Reference Channel | |  | Config 1 | CR.3.1 TDD | | - | | - | |
| SMTC configuration defined in A.3.11.1 and A.3.11.7 | |  | Config 1 | SMTC.1 | | SMTC.1 | | SMTC.7 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1 | 120 | | 120 | | 120 | |
| TRS configuration | |  | Config 1 | TRS.2.1 TDD | | N/A | | N/A | |
| PDSCH/PDCCH TCI state | |  | Config 1 | TCI.State.2 | | N/A | | N/A | |
| EPRE ratio of PSS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | |  | |  | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  | Config 1 | 0 | | 0 | | 0 | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | |  | |  | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | |  | |  | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |  |  | |  | |  | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | |  | |  | |
| Ês | | dBm/SCS | Config 1 | -87 | -87 | -Infinity | -87 | -Infinity | -87 |
| SSBRP Note 3 | | dBm/SCS Note5 | Config 1 | -87 | -87 | -Infinity | -87 | -Infinity | -87 |
| BB Note 8 | | dB | Config 1 | 1.89 | 1.89 | -Infinity | 1.89 | -Infinity | 1.89 |
| IoNote3 | | dBm/95.04 MHz Note5 | Config 1 | -58.01 | -58.01 | -Infinity | -58.01 | -Infinity | -58.01 |
| Propagation Condition | |  | Config 1 | AWGN | | | | AWGN | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Void  Note 3: SSBRP, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Void  Note 5: Equivalent power received by an antenna with 0 dBi gain at the centre of the quiet zone  Note 6: As observed with 0 dBi gain antenna at the centre of the quiet zone  Note 7: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation  Note 8: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 38.101-2 [19], and an allowance of 1dB for UE multi-band relaxation factor ΔMBS from TS 38.101-2 [19] Table 6.2.1.3-4. | | | | | | | | | |

##### A.7.6.x2.1.2 Test Requirements

For both NR cell 2 and NR cell 3, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than X ms from the beginning of time period T2, where X is

10240 for UE supporting power class 1 and 5, or

6400 for UE supporting other power class.

The UE is not required to report SSB time index. 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%.

During the T1 and T2, UE shall be able to report ACK/NACK for all slots with PDCCH/PDSCH on PCell excluding those slots overlapped with

VIL1, ML and VIL2 of NCSG for intra-band FR2 CA

VIL1 and VIL2 of NCSG for inter-band FR2 CA

Measurement gap

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.

**----------------------END OF CHANGE 6----------------------------**

**----------------------START OF CHANGE 7----------------------------**

### A.7.6.x3 SA event triggered reporting tests with NeedForGap in FR2

#### A.7.6.x3.1 SA event triggered reporting test for UE indicating *NeedforInterruptionInfoNR* under non-DRX and no interruption outside configured measurement gaps

##### A.7.6.x3.1.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test partly verifies the TDD intra-frequency cell search and measurement requirements in clause 9.2.6.1 and 9.2.6.2. This test also verifies that the UE does not cause interruption outside measurement gap when SMTC occasions overlap with measurement gap occassions. Supported test configurations are shown in table A.7.6.x3.1.1-1.

The UE who passes this test can skip the corresponding Rel-15 test cases.

Table A.7.6.x3.1.1-1: supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |

There are two cells in the test, a FR2 PCell (Cell 1) and a FR2 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters for the Cell 1 and Cell 2 are given in Table A.7.6.x3.1.1-2, A.7.6.x3.1.1-3 and A.7.6.x3.1.1-4 below.

In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used.

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

The UE operates in an active BWP which does not contain cell-defined SSB so that the UE uses configured measurement gaps to measure on the intra-frequency target SSB.

Table A.7.6.x3.1.1-2: General test parameters for intra-frequency event triggered reporting for SA with TDD PCell in FR2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Config | Value | Comment |
| Active cell |  | 1 | PCell (Cell 1) |  |
| Neighbour cell |  | 1 | Cell 2 | Cell to be identified. |
| RF Channel Number |  | 1 | 1: Cell 1 and Cell 2 | One TDD carrier frequency is used for the NR cells. |
| SMTC configuration |  | 1 | SMTC.1 | 20ms SMTC periodicity |
| Measurement gap repetition periodicity |  | 1 | 40ms | Half of the SMTC occasions are overlapped in MG. |
| A3-Offset | dB | 1 | -11 |  |
| CP length |  | 1 | Normal |  |
| Hysteresis | dB | 1 | 0 |  |
| Time To Trigger | s | 1 | 0 |  |
| Filter coefficient |  | 1 | 0 | L3 filtering is not used |
| DRX |  | 1 | OFF |  |
| Time offset between Cell 1 and Cell 2 |  | 1 | 3 μs | Synchronous cells |
| T1 | s | 1 | 5 |  |
| T2 | s | 1 | 5 |  |

Table A.7.6.x3.1.1-3: NR Cell specific test parameters for intra-frequency event triggered reporting for SA with TDD PCell in FR2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Config | Cell 1 | | Cell 2 | |
|  |  |  | T1 | T2 | T1 | T2 |
| TDD configuration |  | 1 | TDDConf.3.1 | | TDDConf.3.1 | |
| BWchannel | MHz | 1 | 100: NRB,c = 66 | | 100: NRB,c = 66 | |
| Data RBs allocated |  | 1 | 24 | | 24 | |
| Intial BWP configuration |  | 1 | DLBWP.0.1  ULBWP.0.1 | | DLBWP.0.1  ULBWP.0.1 | |
| Active DL BWP configuration |  | 1 | DLBWP.1.2 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1 | ULBWP.1.2 | | ULBWP.1.1 | |
| RLM-RS |  | 1 | CSI-RS | | N/A | |
| PDSCH RMC configuration |  | 1 | SR.3.2 TDD | | N/A | |
| RMSI CORESET RMC configuration |  | 1 | CR.3.1 TDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.3.1 TDD | | N/A | |
| TRS configuration |  | 1 | TRS.2.1 TDD | | N/A | |
| PDSCH/PDCCH TCI states |  | 1 | TCI.State.2 | | N/A | |
| PDSCH/PDCCH subcarrier spacing | kHz | 1 | 120 | | 120 | |
| OCNG Patterns |  | 1 | OP.5 | | N/A | |
| cellIndividualOffset | dB | 1 | N/A | | 16 | |
| NCD-SSB |  | 1 | SSB.1 FR2 | | N/A | |
| CD-SSB |  | 1 | SSB.1 FR2 | | SSB.7 FR2 | |
| Propagation Condition |  | 1 | AWGN | | AWGN | |

Table A.7.6.x3.1.1-4: NR OTA Cell specific test parameters for intra-frequency event triggered reporting for SA with TDD PCell in FR2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Config | Cell 1 | | Cell 2 | | |
|  |  |  | T1 | T2 | T1 | | T2 |
| AoA setup |  | 1 | Setup 3 defined in A.3.15.3 | | | | |
|  |  |  | AoA1 | | AoA2 | | |
| Beam assumptionNote 4 |  | 1 | Rough | | Rough | | |
| Es | dBm/SCS | 1 | -89 | -89 | | -Infinity | -89 |
| BB Note 5 | dB | 1 | -0.12 | -0.12 | | -Infinity | -0.12 |
| SSB\_RP | dBm/SCS | 1 | -89 | -89 | -Infinity | | -89 |
|  | dBm/95.04MHz | 1 | -64.41 | -64.41 | -Infinity | | -64.41 |
| Time multiplexing of the downlink transmissions from each AoA | | 1 | Defined in Figure A.7.6.x3.1.1-1 | | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Void  Note 3: Es/Iot, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation  Note 5: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 38.101-2 [19], and an allowance of 1dB for UE multi-band relaxation factor ΔMBP from TS 38.101-2 [19] Table 6.2.1.3-4. | | | | | | | |



Figure A.7.6.x3.1.1-1: Time multiplexed downlink transmissions (Config 1 example)

##### A.7.6.x3.1.2 Test Requirements

In the test, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than X ms from the beginning of time period T2, where X is

- 600ms for a UE supporting power class 1,

- 360ms for a UE supporting power class 2, 3 and 4

The UE is not required to read the neighbour cell SSB index in this test.

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.

UE is not allowed to cause any interruption outside the configured measurement gap occasions.

#### A.7.6.x3.2 SA event triggered reporting test without gap under non-DRX

##### A.7.6.x3.2.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD intra-frequency cell search requirements in clause 9.2.5.1 and 9.2.5.2. Supported test configurations are shown in table A.7.6.x3.2.1-1.

Table A.7.6.x3.2.1-1: supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 2 | 240 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations. | |

There are two cells in the test, PCell (Cell 1) and a FR2 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters for the Cell 1 and Cell 2 are given in Table A.7.6.x3.2.1-2, A.7.6.x3.2.1-3 and A.7.6.x3.2.1-4 below.

In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used.

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

Table A.7.6.x3.2.1-2: General test parameters for intra-frequency event triggered reporting for SA with TDD PCell in FR2 without gap without DRX

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Config | Value | Comment |
| Active cell |  | 1, 2 | PCell (Cell 1) |  |
| Neighbour cell |  | 1, 2 | Cell 2 | Cell to be identified. |
| RF Channel Number |  | 1, 2 | 1: Cell 1 and Cell 2 | One TDD carrier frequency is used for the NR cells. |
| SMTC configuration |  | 1, 2 | SMTC.1 |  |
| CSI-RS parameters |  | 1, 2 | CSI-RS.3.2 TDD resource #0 | Resource #1 is not used |
| A3-Offset | dB | 1, 2 | -11 |  |
| CP length |  | 1, 2 | Normal |  |
| Hysteresis | dB | 1, 2 | 0 |  |
| Time To Trigger | s | 1, 2 | 0 |  |
| Filter coefficient |  | 1, 2 | 0 | L3 filtering is not used |
| DRX |  | 1, 2 | OFF |  |
| Time offset between Cell 1 and Cell 2 |  | 1, 2 | 3 μs | Synchronous cells |
| T1 | s | 1, 2 | 5 |  |
| T2 | s | 1, 2 | 5 |  |

Table A.7.6.x3.2.1-3: NR Cell specific test parameters for intra-frequency event triggered reporting for SA with TDD PCell in FR2 without gap without DRX

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Config | Cell 1 | | Cell 2 | |
|  |  |  | T1 | T2 | T1 | T2 |
| TDD configuration |  | 1, 2 | TDDConf.3.1 | | TDDConf.3.1 | |
| BWchannel | MHz | 1, 2 | 100: NRB,c = 66 | | 100: NRB,c = 66 | |
| Data RBs allocated |  | 1 | 24 | | 24 | |
| 2 | 48 | | 48 | |
| Intial BWP configuration |  | 1, 2 | DLBWP.0.1  ULBWP.0.1 | | DLBWP.0.1  ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2 | DLBWP.1.2 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.2 | | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | CSI-RS | | SSB | |
| PDSCH RMC configuration |  | 1 | SR.3.2 TDD | | N/A | |
| 2 | SR.3.3 TDD | |
| RMSI CORESET RMC configuration |  | 1 | CR.3.1 TDD | | N/A | |
| 2 | CR.3.2 TDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.3.1 TDD | | N/A | |
| 2 | CCR.3.7 TDD | | N/A | |
| TRS configuration |  | 1, 2 | TRS.2.1 TDD | | N/A | |
| PDSCH/PDCCH TCI states |  | 1, 2 | TCI.State.2 | | N/A | |
| PDSCH/PDCCH subcarrier spacing | kHz | 1, 2 | 120 | | 120 | |
| OCNG Patterns |  | 1, 2 | OP.5 | | N/A | |
| cellIndividualOffset | dB | 1~2 | N/A | | 16 | |
| SSB |  | 1 | SSB.1 FR2 | | SSB.7 FR2 | |
|  |  | 2 | SSB.2 FR2 | | SSB.8 FR2 | |
| Propagation Condition |  | 1, 2 | AWGN | | AWGN | |

Table A.7.6.x3.2.1-4: NR OTA Cell specific test parameters for intra-frequency event triggered reporting for SA with TDD PCell in FR2 without gap without DRX

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Config | Cell 1 | | Cell 2 | | |
|  |  |  | T1 | T2 | T1 | | T2 |
| AoA setup |  | 1, 2 | Setup 3 defined in A.3.15.3 | | | | |
|  |  |  | AoA1 | | AoA2 | | |
| Beam assumptionNote 4 |  | 1,2 | Rough | | Rough | | |
| Es | dBm/SCS | 1 | -89 | -89 | | -Infinity | -89 |
|  |  | 2 | -86 | -86 | | -Infinity | -86 |
| BB Note 5 | dB | 1, 2 | -0.12 | -0.12 | | -Infinity | -0.12 |
| SSB\_RP | dBm/SCS | 1 | -89 | -89 | -Infinity | | -89 |
|  |  | 2 | -86 | -86 | -Infinity | | -86 |
|  | dBm/95.04MHz | 1 | -64.41 | -64.41 | -Infinity | | -64.41 |
| 2 | -61.41 | -61.41 | -Infinity | | -61.41 |
| Time multiplexing of the downlink transmissions from each AoA | | 1, 2 | Defined in Figure A.7.6.x3.2.1-1 | | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Es/Iot, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation.  Note 4: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 38.101-2 [19], and an allowance of 1dB for UE multi-band relaxation factor ΔMBP from TS 38.101-2 [19] Table 6.2.1.3-4. | | | | | | | |



Figure A.7.6.x3.2.1-1: Time multiplexed downlink transmissions (Config 1 example)

##### A.7.6.x3.2.2 Test Requirements

In the test, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than X ms from the beginning of time period T2, where X is

- 2.4s for a UE supporting power class 1,

- 1.44s for a UE supporting power class 2, 3 and 4

The UE is not required to read the neighbour cell SSB index in this test.

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.

**----------------------END OF CHANGE 7----------------------------**

**----------------------START OF CHANGE 8----------------------------**

#### A.8.4.2.x1 NR Inter-RAT event triggered reporting tests for FR2 without MG nor DRX

##### A.8.4.2.x1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the NR inter-RAT cell search requirements in clause 8.1.2.4.29 of TS 36.133 [15] for E-UTRAN FDD-NR measurements and clause 8.1.2.4.30 of TS 36.133 [15] for E-UTRAN TDD-NR measurements, as well as the interruption requriements in clause 7.8.2.22.

In this test, there are two cells: E-UTRA cell 1 as PCell on E-UTRA RF channel 1 and NR cell 2 as neighbour cell in FR2 on NR RF channel 1. The test parameters are given in Tables A.8.4.2.x1.1-1, A.8.4.2.x1.1-2 and A.8.4.2.x1.1-3.

The cell specific test parameters for E-UTRA cell1 as PCell are defined in clause A.3.7.2.2.

No measurement gap is configured for the test. UE is continuously scheduled in DL in LTE PCell during the test.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 (Inter RAT neighbour becomes better than threshold) [16] 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 timing information of NR cell 2.

Table A.8.4.2.x1.1-1: NR inter-RAT event triggered reporting tests without SSB index reading for FR2 in non-DRX

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

Table A.8.4.2.x1.1-2: General test parameters for NR inter-RAT event triggered reporting for FR2 without MG nor DRX

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| E-UTRA RF Channel Number |  | 1, 2 | 1 | One E-UTRA carrier frequency is used. |
| NR RF Channel Number |  | 1, 2 | 1 | One FR2 NR carrier frequency is used. |
| Active cell |  | 1, 2 | E-UTRA cell 1 (PCell) | E-UTRA cell 1 is on E-UTRA RF channel number 1 as defined in clause A.3.7.2.2. |
| Neighbour cell |  | 1, 2 | NR cell 2 | NR cell 2 is on NR RF channel number 1. |
| b1-ThresholdNR | dBm | 1, 2 | Note 1 | SS-RSRP threshold for SS-RSRP measurement on cell 2 for event B1 [16] |
| SMTC configuration |  | 1, 2 | SMTC.3 | As defined in A.3.11. |
| Hysteresis | dB | 1, 2 | 0 |  |
| CP length |  | 1, 2 | Normal |  |
| TimeToTrigger | s | 1, 2 | 0 |  |
| Filter coefficient |  | 1, 2 | 0 | L3 filtering is not used |
| DRX |  | 1, 2 | OFF | DRX is not used |
| Time offset between serving and neighbour cells |  | 1, 2 | 3μs | Synchronous cells. |
| T1 | s | 1, 2 | 10 |  |
| T2 | s | 1, 2 |  |  |
| Note 1: The value of b1-ThresholdNR is defined in Table A.8.4.2.x1.1-3 | | | | |

Table A.8.4.2.x1.1-3: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR2 without SSB time index detection in non-DRX

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Cell 2 | |
|  | |  |  | T1 | T2 |
| AoA setup defined in A.3.15.2.1 | |  | 1, 2 | Setup 2a | |
| Assumption for UE beamsNote 5 | |  | 1, 2 | Rough | |
| NR RF Channel Number | |  | 1, 2 | 1 | |
| Duplex mode | |  | 1, 2 | TDD | |
| TDD configuration | |  | 1, 2 | TDDConf.3.1 | |
| BWchannel | | MHz | 1, 2 | 100: NRB,c = 24 | |
| OCNG patterns defined in A.3.2.1.1 | |  | 1, 2 | OP. 3 | |
| SSB configuration | |  | 1, 2 | SSB.3 FR2 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | 1, 2 | 120 | |
| b1-ThresholdNR | UE power class 3 | dBm/SCS | 1, 2 | -112 | |
| EPRE ratio of PSS to SSS | |  | 1, 2 | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |  |  | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | |
| EPRE ratio of OCNG DMRS to SSS (Note 1) | |  |  |  | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | |
| Ês | | dBm/SCS | 1, 2 | - Infinity | -80.6 |
| SS B\_RP Note 3 | | dBm/SCS | 1, 2 | -Infinity | -80.6 |
| BB Note 6 | | dB | 1, 2 | -Infinity | 8.3 |
| IoNote3 | | dBm/95.04MHz | 1, 2 | -Infinity | -56.0 |
| Propagation Condition | |  | 1, 2 | AWGN | |
| Note 1: OCNG shall be used such that a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Void  Note 3: SS B\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Void  Note 5: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation  Note 6: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 38.101-2 [19], and an allowance of 1dB for UE multi-band relaxation factor ΔMBP from TS 38.101-2 [19] Table 6.2.1.3-4. | | | | | |

##### A.8.4.2.x1.2 Test Requirements

In the test, the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than D1 ms from the beginning of time period T2, where D1 = 12.8s for UE power class 3.

During the test, the interruption ratio (number of interrupted subframes over the number of total subframes) in LTE PCell shall be less than 1.25%, and each interruption shall not exceed 1 subframe.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

In the test, the UE is not required to report SSB time index.

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.

**----------------------END OF CHANGE 8----------------------------**

**----------------------START OF CHANGE 9----------------------------**

##### A.8.4.2.y NR Inter-RAT event triggered reporting tests for FR1 without gaps when DRX is not used

###### A.8.4.2.y.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when performing inter-RAT NR measurements without gaps and with interruptions. This test will partly verify the NR inter-RAT cell search requirements in clause 8.1.2.4.21 of TS 36.133 [15] for E-UTRAN FDD-NR measurements and clause 8.1.2.4.22 of TS 36.133 [15] for E-UTRAN TDD-NR measurements.

The purpose of this test is also to verify that the interruption ratio does not exceed the limits for the LTE PCell during the inter-RAT NR measurement without gaps and with interruptions. This test will verify the interruption ratio for LTE PCell in standalone LTE specified in clause 7.8.2.22.

In this test, there are two cells: E-UTRA cell 1 as PCell on E-UTRA RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 1. The test parameters are given in Tables A.8.4.2.Y.1-1, A.8.4.2.Y.1-2, A.8.4.2.Y.1-3 and A.8.4.2.Y.1-4.

The serving frequency should be selected for this test case should be one in which the UE reports UE capabilities interRAT-NeedForGapsNR-r16=FALSE and interRAT-NeedForInterruptionNR-r18=’nogap-interruption’ or interRAT-NeedForInterruptionNR-r18=’nogap-nointerruption’.

No measurement gap is configured for the test. UE is continuously scheduled in DL in LTE PCell during the test.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 Inter RAT neighbour becomes better than threshold) [16] 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 NR cell 2.

Table A.8.4.2.Y.1-1: NR inter-RAT event triggered reporting tests without gaps and with interruptions

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | LTE FDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | LTE FDD, NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| 4 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 5 | LTE TDD, NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 6 | LTE TDD, NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurations. | |

Table A.8.4.2.Y.1-2: General test parameters for NR inter-RAT event triggered reporting for FR1 without gaps and with interruptions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
|  |  |  |  |
| E-UTRA RF Channel Number |  | 1, 2, 3, 4, 5, 6 | 1 | One E-UTRAcarrier frequency is used. |
| NR RF Chanel Number |  | 1, 2, 3, 4, 5, 6 | 1 | One FR1 NR carrier frequency is used. |
| Active cell |  | 1, 2, 3, 4, 5, 6 | E-UTRA cell 1 (PCell) | E-UTRA cell 1 is on E-UTRA RF channel number 1. |
| Neighbour cell |  | 1, 2, 3, 4, 5, 6 | NR cell 2 | NR cell 2 is on NR RF channel number 1. |
| b1-ThresholdNR | dBm | 1, 2, 3, 4, 5, 6 | Note 1 | SS-RSRP threshold for SS-RSRP measurement on cell 2 for event B1 [16] |
| Hysteresis | dB | 1, 2, 3, 4, 5, 6 | 0 |  |
| CP length |  | 1, 2, 3, 4, 5, 6 | Normal |  |
| TimeToTrigger | s | 1, 2, 3, 4, 5, 6 | 0 |  |
| Filter coefficient |  | 1, 2, 3, 4, 5, 6 | 0 | L3 filtering is not used |
| DRX |  | 1, 2, 3, 4, 5, 6 | OFF | DRX is not used |
| Time offset between serving and neighbour cells |  | 1, 4 | 3ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
|  |  | 2, 3, 5, 6 | 3μs | Synchronous cells. |
| T1 | s | 1, 2, 3, 4, 5, 6 | 5 |  |
| T2 | s | 1, 2, 3, 4, 5, 6 | 2 |  |
| Note 1: The value of b1-ThresholdNR is defined in Table A.8.4.2.Y.1-4 | | | | |

Table A.8.4.2.Y.1-3: E-UTRAN PCell specific test parameters for NR inter-RAT event triggered reporting in non-DRX with NR neighbour cell in FR1 without gaps and with interruptions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Configuration | Cell 1 | |
|  |  |  | T1 | T2 |
| RF channel number |  | 1, 2, 3, 4, 5, 6 | 1 | |
| Duplex mode |  | 1, 2, 3 | FDD | |
| 4, 5, 6 | TDD | |
| TDD special subframe configurationNote1 |  | 4, 5, 6 | 6 | |
| TDD uplink-downlink configurationNote1 |  | 4, 5, 6 | 1 | |
| BWchannel | MHz | 1, 2, 3, 4, 5, 6 | 5 MHz: NRB,c = 25  10 MHz: NRB,c = 50  20 MHz: NRB,c = 100 | |
| PDSCH parameters:  DL Reference Measurement ChannelNote2 |  | 1, 2, 3 | 5 MHz: R.7 FDD  10 MHz: R.3 FDD  20 MHz: R.6 FDD | |
|  |  | 4, 5, 6 | 5 MHz: R.4 TDD  10 MHz: R.0 TDD  20 MHz: R.3 TDD | |
| PCFICH/PDCCH/PHICH parameters:  DL Reference Measurement ChannelNote2 |  | 1, 2, 3 | 5 MHz: R.11 FDD  10 MHz: R.6 FDD  20 MHz: R.10 FDD | |
|  |  | 4, 5, 6 | 5 MHz: R.11 TDD  10 MHz: R.6 TDD  20 MHz: R.10 TDD | |
| OCNG PatternsNote2 |  | 1, 2, 3 | 5 MHz: OP.20 FDD  10 MHz: OP.10 FDD  20 MHz: OP.17 FDD | |
|  |  | 4, 5, 6 | 5 MHz: OP.9 TDD  10 MHz: OP.1 TDD  20 MHz: OP.7 TDD | |
| b2-Threshold1 | dBm | 1, 2, 3, 4, 5, 6 | -77 | |
| PBCH\_RA | dB | 1, 2, 3, 4, 5, 6 | 0 | |
| PBCH\_RB |  |  |  | |
| PSS\_RA |  |  |  | |
| SSS\_RA |  |  |  | |
| PCFICH\_RB |  |  |  | |
| PHICH\_RA |  |  |  | |
| PHICH\_RB |  |  |  | |
| PDCCH\_RA |  |  |  | |
| PDCCH\_RB |  |  |  | |
| PDSCH\_RA |  |  |  | |
| PDSCH\_RB |  |  |  | |
| OCNG\_RANote3 |  |  |  | |
| OCNG\_RBNote3 |  |  |  | |
| NocNote4 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -104 | |
| Ês/Noc | dB | 1, 2, 3, 4, 5, 6 | 17 | 17 |
| Ês/IotNote5 | dB | 1, 2, 3, 4, 5, 6 | 17 | 17 |
| RSRPNote5 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -87 | -87 |
| SCH\_RPNote5 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -87 | -87 |
| IoNote5 | dBm/9MHz | 1, 2, 3, 4, 5, 6 | -59.13+10log (NRB,c /50) | -59.13+10log (NRB,c /50) |
| Propagation Condition Note6 |  | 1, 2, 3, 4, 5, 6 | AWGN | |
| Antenna Configuration and Correlation Matrix Note6 |  | 1, 2, 3, 4, 5, 6 | 1x2 | |
| Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [23].  Note 2: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [15] respectively.  Note 3: OCNG shall be used such that all cells are fully allocated, and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.  Note 5: Ês/Iot, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 6: Propagation condition and correlation matrix are defined in clause B.2 in TS 36.101 [25]. | | | | |

Table A.8.4.2.Y.1-4: NR neighbour cell specific test parameters for NR inter-RAT event triggered reporting for FR1 without SSB time index detection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 2 | |
|  |  |  | T1 | T2 |
| NR RF Channel Number |  | 1, 2, 3, 4, 5, 6 | 1 | |
| Duplex mode |  | 1, 4 | FDD | |
|  |  | 2, 3, 5, 6 | TDD | |
| TDD configuration |  | 2, 5 | TDDConf.1.1 | |
|  |  | 3, 6 | TDDConf.2.1 | |
| BWchannel | MHz | 1, 2, 4, 5 | 10: NRB,c = 52 | |
|  |  | 3, 6 | 40: NRB,c = 106 | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) |  | 1, 2, 3, 4, 5, 6 | OP.1 | |
| SMTC configuration defined in A.3.11 |  | 1, 4 | SMTC.2 | |
|  |  | 2, 3, 5, 6 | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | kHz | 1, 2, 4, 5 | 15 | |
|  |  | 3, 6 | 30 | |
| b1-ThresholdNR | dBm/SCS | 1, 2, 4, 5 | -101 | |
|  |  | 3, 6 | -98 | |
| EPRE ratio of PSS to SSS |  | 1, 2, 3, 4, 5, 6 | 0 | |
| EPRE ratio of PBCH DMRS to SSS |  |  |  | |
| EPRE ratio of PBCH to PBCH DMRS |  |  |  | |
| EPRE ratio of PDCCH DMRS to SSS |  |  |  | |
| EPRE ratio of PDCCH to PDCCH DMRS |  |  |  | |
| EPRE ratio of PDSCH DMRS to SSS |  |  |  | |
| EPRE ratio of PDSCH to PDSCH |  |  |  | |
| EPRE ratio of OCNG DMRS to SSS (Note 1) |  |  |  | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) |  |  |  | |
| Note2 | dBm/15kHz | 1, 2, 3, 4, 5, 6 | -98 | |
| Note2 | dBm/SCS | 1, 2, 4, 5 | -98 | |
| 3, 6 | -95 | |
| SS-RSRP Note 3 | dBm/SCS | 1, 2, 4, 5 | -Infinity | -91 |
| 3, 6 | -Infinity | -88 |
|  | dB | 1, 2, 3, 4, 5, 6 | -Infinity | 7 |
|  | dB | 1, 2, 3, 4, 5, 6 | -Infinity | 7 |
| IoNote3 | dBm/9.36MHz | 1, 2, 4, 5 | -70.05 | -62.26 |
| dBm/38.16MHz | 3, 6 | -63.95 | -56.16 |
| Propagation Condition |  | 1, 2, 3, 4, 5, 6 | AWGN | |
| Antenna Configuration and Correlation Matrix |  | 1, 2, 3, 4, 5, 6 | 1x2 | |
| Note 1: OCNG shall be used such that the cell is fully allocated, and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | |

##### A.8.4.2.Y.2 Test Requirements

The UE shall be continuously scheduled on PCell during the entire length of T1 and T2. During both time durations the interruption ratio should not exceed 2.5%.

In the test, the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than D1 ms from the beginning of time period T2.

* D1 = 1280 for a UE that supports interRAT-NeedForInterruptionNR-r18=’nogap-interruption’
* D1 = 800 for a UE that supports interRAT-NeedForInterruptionNR-r18=’nogap-nointerruption’

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE is not required to report SSB time index.

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.

**----------------------END OF CHANGE 9----------------------------**