**3GPP TSG-RAN WG4 Meeting #111 R4-2410422**

**Fukuoka, JP, 20th May – 24th May, 2024**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **4568** | **rev** | **3** | **Current version:** | **17.13.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | (NR\_HST\_FR1\_enh-Perf) CR on Test cases for NR FR1 HST R17 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | MediaTek inc. | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_HST\_FR1\_enh-Perf | | | | |  | ***Date:*** | | | 2024-05-12 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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:*** | | This is a resubmission of an approve CR in RAN4#110 which is postponed due to error on cover sheet of Cat A CR.   1. DRX.4 is applicable for E-UTRA serving cell. In A.4.6.1.8, A.4.6.2.9 and A.6.6.2.12, DRX configuration for NR serving cell should be used. 2. For test cases A.4.6.2.9 and A.6.6.2.12, the orignal wording is a bit misleading. Measurement gap pattern configuration should be also applicable to UE supporting per-FR gap. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Add a new DRX configuration and use it in A.4.6.1.8, A.4.6.2.9 and A.6.6.2.12. 2. Correct the wording to make it clear that measurement gap pattern configurations are also applicable to UE supporting per-FR gap. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | 1. DRX configuration is not correct. 2. Whether measurement gap pattern configuration is applicable to UE supporting per-FR gap is not clear | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | (new)A.3.3.14, A.4.6.1.8, A.4.6.2.9, A.6.6.2.12 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of change 1>

### A.3.3.14 DRX Configuration 14: DRX cycle = 160 ms and TAT = Infinity

Table A.3.3.13-1: DRX.14: DRX cycle = 160 ms and time alignment timer (TAT) = Infinity

|  |  |
| --- | --- |
| **Field** | **Value** |
| drx-onDurationTimer | 6 ms |
| drx-InactivityTimer | 1 ms |
| drx-RetransmissionTimerDL | 1 slot |
| drx-RetransmissionTimerUL | 1 slot |
| drx-LongCycleStartOffset | 160 ms |
| shortDRX | disable |
| TimeAlignmentTimer | Infinity |
| Note: This DRX configuration is applicable for NR serving cell. The DRX cycle and time alignment timer parameters are specified in clause 6.3.2 in TS 38.331 [2] | |

<End of change 1>

<Start of change 2>

#### A.4.6.1.8 EN-DC event triggered reporting tests for FR1 cell without SSB time index detection when DRX is used for UE configured with *highSpeedMeasCA-Scell-r17*

##### A.4.6.1.8.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the EN-DC intra-frequency NR measurement requirements in clause 9.2.5.

In this test, there are four cells: LTE cell 1 as PCell on E-UTRA RF channel 1, NR cell 2 as PSCell in FR1 on NR RF channel 1, NR cell 3 as deactivated SCell in FR1 on NR RF channel 2, and NR cell 4 as neighbour cell on the same frequency as cell 3. The test parameters and configurations are given in Tables A.4.6.1.8.1-1, A.4.6.1.8.1-2, and A.4.6.1.8.1-3.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A6 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 3.

The configuration of LTE cell 1 is defined in table A.3.7.2.1-1. Supported test configurations are shown in table A.4.6.1.8.1-1.

Table A.4.6.1.8.1-1: EN-DC event triggered reporting tests for FR1 cell without SSB time index detection when DRX is used for UE configured with *highSpeedMeasCA-Scell-r17*

|  |  |
| --- | --- |
| Config | 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  Note 2: NR cell3 has the same SCS, BW and duplex mode as NR cell2 | |

Table A.4.6.1.8.1-2: General test parameters for EN-DC event triggered reporting tests for FR1 cell without SSB time index detection when DRX is used for UE configured with *highSpeedMeasCA-Scell-r17*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | | Comment |
| highSpeedMeasCA-Scell-r17 |  | Config 1,2,3,4,5,6 | Present | | To enable high speed measurement enhancements |
| E-UTRA RF Channel Number |  | Config 1,2,3,4,5,6 | 1 | | One E-UTRAN carrier frequencies is used. |
| NR RF Channel Number |  | Config 1,2,3,4,5,6 | 1, 2 | | Two FR1 NR carrier frequencies are used. |
| Active cell |  | Config 1,2,3,4,5,6 | LTE Cell 1 (PCell) and NR cell 2 (PScell) | | LTE Cell 1 is on E-UTRA RF channel number 1.  NR Cell 2 is on NR RF channel number 1. |
| Deactivated Scell |  | Config 1,2,3,4,5,6 | NR cell 3 | | NR cell 3 is on NR RF channel number 2. |
| Neighbour cell |  | Config 1,2,3,4,5,6 | NR cell 4 | | NR cell 4 is on NR RF channel number 2. |
| A6-Offset | dB | Config 1,2,3,4,5,6 | -4.5 | |  |
| Hysteresis | dB | Config 1,2,3,4,5,6 | 0 | |  |
| CP length |  | Config 1,2,3,4,5,6 | Normal | |  |
| Measurement gap pattern Id |  |  | OFF | |  |
| SCell measurement cycle (measCycleSCell) |  | Config 1,2,3,4,5,6 | 160 ms | |  |
| TimeToTrigger | s | Config 1,2,3,4,5,6 | 0 | |  |
| Filter coefficient |  | Config 1,2,3,4,5,6 | 0 | | As specified in clause A.3.3 |
| DRX |  | Config 1,2,3,4,5,6 | DRX.14 | |  |
| Time offset between PCell and PSCell |  | Config 1,2,3,4,5,6 | 3 μs | | Synchronous EN-DC |
| Time alignment error between cell2 and cell3 | μs | ≤ Time alignment error as specified in TS 38.104 [13] clause 6.5.3.1. | The value of time alignment error depends upon the type of carrier aggregation. | | Time alignment error between cell2 and cell3 |
| Time offset between serving l and neighbour cells |  | Config 1,4 | 3 ms | | Asynchronous cells.  The timing of Cell 4 is 3ms later than the timing of Cell 3. |
|  |  | Config 2,3,5,6 | 3 μs | | Synchronous cells. |
| T1 | s | Config 1,2,3,4,5,6 | 5 | |  |
| T2 | s | Config 1,2,3,4,5,6 | 1 | |  |

Table A.4.6.1.8.1-3: Cell specific test parameters for EN-DC event triggered reporting tests for FR1 cell without SSB time index detection when DRX is used for UE configured with *highSpeedMeasCA-Scell-r17*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test | Cell 2 | | | Cell 3 | | Cell 4 | |
|  |  | configuration | T1 | T2 | | T1 | T2 | T1 | T2 |
| NR RF Channel Number |  | Config 1,2,3,4,5,6 | 1 | | | 2 | | 2 | |
| Duplex mode |  | Config 1,4 | FDD | | | | | FDD | |
|  |  | Config 2,3,5,6 | TDD | | | | | TDD | |
| BWchannel | MHz | Config 1,4 | 10: NRB,c = 52 | | | | | 10: NRB,c = 52 | |
|  |  | Config 2,5 | 10: NRB,c = 52 | | | | | 10: NRB,c = 52 | |
|  |  | Config 3,6 | 40: NRB,c = 106 | | | | | 40: NRB,c = 106 | |
| BWP BW | MHz | Config 1,4 | 10: NRB,c = 52 | | | | | 10: NRB,c = 52 | |
|  |  | Config 2,5 | 10: NRB,c = 52 | | | | | 10: NRB,c = 52 | |
|  |  | Config 3,6 | 40: NRB,c = 106 | | | | | 40: NRB,c = 106 | |
| TDD configuration |  | Config 2,5 | TDDConf.1.1 | | | TDDConf.1.1 | | TDDConf.1.1 | |
|  |  | Config 3,6 | TDDConf.2.1 | | | TDDConf.2.1 | | TDDConf.2.1 | |
| Initial DL BWP |  | Config 1,2,3,4,5,6 | DLBWP.0.1 | | | DLBWP.0.1 | | DLBWP.0.1 | |
| Initial UL BWP |  | Config 1,2,3,4,5,6 | ULBWP.0.1 | | | NA | | NA | |
| Dedicated DL BWP |  | Config 1,2,3,4,5,6 | DLBWP.1.1 | | | DLBWP.1.1 | | DLBWP.1.1 | |
| Dedicated UL BWP |  | Config 1,2,3,4,5,6 | ULBWP.1.1 | | | NA | | NA | |
| TRS configuration |  | Config 1,4 | TRS.1.1 FDD | | | NA | | NA | |
|  |  | Config 2,5 | TRS.1.1 TDD | | | NA | | NA | |
|  |  | Config 3,6 | TRS.1.2 TDD | | | NA | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) |  | Config 1,2,3,4,5,6 | OP.1 | | | OP.1 | | OP.1 | |
| PDSCH Reference |  | Config 1,4 | SR.1.1 FDD | | | SR.1.1 FDD | | SR.1.1 FDD | |
| measurement channel |  | Config 2,5 | SR.1.1 TDD | | | SR.1.1 TDD | | SR.1.1 TDD | |
|  |  | Config 3,6 | SR2.1 TDD | | | SR2.1 TDD | | SR2.1 TDD | |
| RMSI CORESET Reference |  | Config 1,4 | CR.1.1 FDD | | | CR.1.1 FDD | | CR.1.1 FDD | |
| Channel |  | Config 2,5 | CR.1.1 TDD | | | CR.1.1 TDD | | CR.1.1 TDD | |
|  |  | Config 3,6 | CR2.1 TDD | | | CR2.1 TDD | | CR2.1 TDD | |
| Dedicated CORESET Reference Channel |  | Config 1,4 | CCR.1.1 FDD | | | CCR.1.1 FDD | | CCR.1.1 FDD | |
|  | Config 2,5 | CCR.1.1 TDD | | | CCR.1.1 TDD | | CCR.1.1 TDD | |
|  | Config 3,6 | CCR.2.1 TDD | | | CCR.2.1 TDD | | CCR.2.1 TDD | |
| SSB parameters |  | Config 1,4 | SSB.1 FR1 | | | SSB.5 FR1 | | SSB.5 FR1 | |
|  |  | Config 2,5 | SSB.1 FR1 | | | SSB.5 FR1 | | SSB.5 FR1 | |
|  |  | Config 3,6 | SSB.2 FR1 | | | SSB.6 FR1 | | SSB.6 FR1 | |
| SMTC configuration |  | Config 1,4 | SMTC.2 | | | SMTC.5 | | SMTC.5 | |
| defined in A.3.11 |  | Config 2,3,5,6 | SMTC.1 | | | SMTC.4 | | SMTC.4 | |
| PDSCH/PDCCH | kHz | Config 1,2,4,5 | 15 | | | | | | |
| subcarrier spacing |  | Config 3,6 | 30 | | | | | | |
| 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 1,2,3,4,5,6 | 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) |  |  |  | | |  | |  | |
| Note2 | dBm/15kHz |  | -98 | | | -98 | | -98 | |
| Note2 | dBm/SCS | Config 1,2,4,5 | -98 | | | -98 | | -98 | |
|  | Config 3,6 | -95 | | | -95 | | -95 | |
| SS-RSRP Note 3 | dBm/SCS | Config 1,2,4,5 | -94 | | -94 | -94 | -94 | -Infinity | -94 |
|  | Config 3,6 | -91 | | -91 | -91 | -91 | -Infinity | -91 |
|  | dB | Config 1,2,3,4,5,6 | 4 | | 4 | 4 | -1.46 | -Infinity | -1.46 |
|  | dB | Config 1,2,3,4,5,6 | 4 | | 4 | 4 | 4 | -Infinity | 4 |
| IoNote3 | dBm/9.36MHz | Config 1,2,4,5 | -64.59 | | -64.59 | -64.59 | -62.26 | -64.59 | -62.26 |
|  | dBm/38.16MHz | Config 3,6 | -58.49 | | -58.49 | -58.49 | -56.15 | -58.49 | -56.15 |
| Propagation Condition |  | Config 1,2,4,5 | AWGN | | | AWGN | | AWGN 1944Hz Note 5 | |
|  | Config 3,6 | AWGN | | | AWGN | | AWGN 3334Hz Note 6 | |
| 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.  Note 5: The AWGN 1944 Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 1944Hz.  Note 6: The AWGN 3334 Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 3334Hz. | | | | | | | | | |

##### A.4.6.1.8.2 Test Requirements

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 1600 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%.

UE is not required to report SSB time index.

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.4.6.2.9 EN-DC event triggered reporting tests for FR1 cell without SSB time index detection when DRX is used for UE configured with highSpeedMeasInterFreq-r17

##### A.4.6.2.9.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event for UE configured with highSpeedMeasInterFreq-r17. This test will partly verify the EN-DC inter-frequency NR cell search requirements in clause 9.3.4.

In this test, there are three cells: LTE cell 1 as PCell on E-UTRA RF channel 1, NR cell 2 as PSCell in FR1 on NR RF channel 1 and NR cell 3 as neighbour cell in FR1 on NR RF channel 2. The test parameters and configurations are given in Tables A.4.6.2.9.1-1, A.4.6.2.9.1-2, and A.4.6.2.9.1-3.

Measurement gap pattern configuration is defined in Table A.4.6.2.9.1-2 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 3.

The configuration of LTE cell 1 is defined in table A.3.7.2.1-1. Supported test configurations are shown in table A.4.6.2.9.1-1.

UE needs to be provided with new Timing Advance Command MAC control at least once during each time alignment timer period to maintain uplink time alignment. Furthermore, UE is allocated with PUSCH resource at every DRX cycle.

Table A.4.6.2.9.1-1: EN-DC event triggered reporting tests without SSB index reading for FR1-FR1 for UE configured with highSpeedMeasInterFreq-r17

|  |  |
| --- | --- |
| Config | 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  Note 2: target NR cell3 has the same SCS, BW and duplex mode as NR serving cell2 | |

Table A.4.6.2.9.1-2: General test parameters for EN-DC inter-frequency event triggered reporting without SSB time index detection for UE configured with highSpeedMeasInterFreq-r17

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test | Value | Comment |
|  |  | configuration |  |
| E-UTRA RF Channel Number |  | Config 1,2,3,4,5,6 | 1 | One E-UTRAN carrier frequencies is used. |
| NR RF Channel Number |  | Config 1,2,3,4,5,6 | 1, 2 | Two FR1 NR carrier frequencies is used. |
| Active cell |  | Config 1,2,3,4,5,6 | LTE Cell 1 (PCell) and NR cell 2 (PScell) | LTE Cell 1 is on E-UTRA RF channel number 1.  NR Cell 2 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2,3,4,5,6 | NR cell 3 | NR cell 3 is on NR RF channel number 2. |
| Gap Pattern Id |  | Config 1,2,3,4,5,6 | 0  4 | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1,2,3,4,5,6 | 9 |  |
| A3-Offset | dB | Config 1,2,3,4,5,6 | -6 |  |
| Hysteresis | dB | Config 1,2,3,4,5,6 | 0 |  |
| CP length |  | Config 1,2,3,4,5,6 | Normal |  |
| TimeToTrigger | s | Config 1,2,3,4,5,6 | 0 |  |
| Filter coefficient |  | Config 1,2,3,4,5,6 | 0 | L3 filtering is not used |
| DRX | ms | Config 1,2,3,4,5,6 | DRX.14 | As specified in clause A.3.3 |
| Time offset between PCell and PSCell |  | Config 1,2,3,4,5,6 | 3 μs | Synchronous EN-DC |
| Time offset between serving and neighbour cells |  | Config 1,4 | 3ms | Asynchronous cells.  The timing of Cell 3 is 3ms later than the timing of Cell 2. |
|  |  | Config 2,3,5,6 | 3μs | Synchronous cells. |
| T1 | s | Config 1,2,3,4,5,6 | 5 |  |
| T2 | s | Config 1,2,3,4,5,6 | 3 |  |

Table A.4.6.2.9.1-3: Cell specific test parameters for EN-DC inter-frequency event triggered reporting without SSB time index detection for UE configured with highSpeedMeasInterFreq-r17

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test | Cell 2 | | Cell 3 | |
|  |  | configuration | T1 | T2 | T1 | T2 |
| NR RF Channel Number |  | Config 1,2,3,4,5,6 | 1 | | 2 | |
| Duplex mode |  | Config 1,4 | FDD | | | |
|  |  | Config 2,3,5,6 | TDD | | | |
| BWchannel | MHz | Config 1,4 | 10: NRB,c = 52 | | | |
|  |  | Config 2,5 | 10: NRB,c = 52 | | | |
|  |  | Config 3,6 | 40: NRB,c = 106 | | | |
| BWP BW | MHz | Config 1,4 | 10: NRB,c = 52 | | | |
|  |  | Config 2,5 | 10: NRB,c = 52 | | | |
|  |  | Config 3,6 | 40: NRB,c = 106 | | | |
| TDD configuration |  | Config 2,5 | TDDConf.1.1 | | | |
|  |  | Config 3,6 | TDDConf.2.1 | | | |
| Initial DL BWP |  | Config 1,2,3,4,5,6 | DLBWP.0.1 | | NA | |
| Initial UL BWP |  | Config 1,2,3,4,5,6 | ULBWP.0.1 | | NA | |
| Dedicated DL BWP |  | Config 1,2,3,4,5,6 | DLBWP.1.1 | | NA | |
| Dedicated UL BWP |  | Config 1,2,3,4,5,6 | ULBWP.1.1 | | NA | |
| TRS configuration |  | Config 1,4 | TRS.1.1 FDD | | NA | |
|  |  | Config 2,5 | TRS.1.1 TDD | | NA | |
|  |  | Config 3,6 | TRS.1.2 TDD | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) |  | Config 1,2,3,4,5,6 | OP.1 | | OP.1 | |
| PDSCH Reference |  | Config 1,4 | SR.1.1 FDD | | - | |
| measurement channel |  | Config 2,5 | SR.1.1 TDD | |  | |
|  |  | Config 3,6 | SR2.1 TDD | |  | |
| RMSI CORESET Reference |  | Config 1,4 | CR.1.1 FDD | | - | |
| Channel |  | Config 2,5 | CR.1.1 TDD | |  | |
|  |  | Config 3,6 | CR2.1 TDD | |  | |
| Dedicated CORESET Reference Channel |  | Config 1,4 | CCR.1.1 FDD | | - | |
|  | Config 2,5 | CCR.1.1 TDD | |  | |
|  | Config 3,6 | CCR.2.1 TDD | |  | |
| SSB parameters |  | Config 1,4 | SSB.1 FR1 | | SSB.5 FR1 | |
|  |  | Config 2,5 | SSB.1 FR1 | | SSB.5 FR1 | |
|  |  | Config 3,6 | SSB.2 FR1 | | SSB.6 FR1 | |
| SMTC configuration defined |  | Config 1,4 | SMTC.2 | | SMTC.5 | |
| in A.3.11 |  | Config 2,3,5,6 | SMTC.1 | | SMTC.4 | |
| PDSCH/PDCCH subcarrier spacing | kHz | Config 1,2,4,5 | 15 | | | |
|  |  | Config 3,6 | 30 | | | |
| 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 1,2,3,4,5,6 | 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) |  |  |  | |  | |
| Note2 | dBm/15kHz |  | -98 | | -98 | |
| Note2 | dBm/SCS | Config 1,2,4,5 | -98 | | -98 | |
|  |  | Config 3,6 | -95 | | -95 | |
| SS-RSRP Note 3 | dBm/SCS | Config 1,2,4,5 | -94 | -94 | -Infinity | -91 |
|  |  | Config 3,6 | -91 | -91 | -Infinity | -88 |
|  | dB | Config 1,2,3,4,5,6 | 4 | 4 | -Infinity | 7 |
|  | dB | Config 1,2,3,4,5,6 | 4 | 4 | -Infinity | 7 |
| IoNote3 | dBm/9.36MHz | Config 1,2,4,5 | -64.59 | -64.59 | -70.05 | -62.26 |
|  | dBm/38.16MHz | Config 3,6 | -58.49 | -58.49 | -63.94 | -56.15 |
| Propagation Condition |  | Config 1,2, 4,5 | AWGN | | AWGN 1944Hz Note 5 | |
|  | Config 3,6 |  | | AWGN 3334Hz Note 6 | |
| 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.  Note 5: The AWGN 1944 Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 1944Hz.  Note 6: The AWGN 3334 Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 3334Hz. | | | | | | |

##### A.4.6.2.9.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 2240 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%.

UE is not required to report SSB time index.

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.6.6.2.12 SA event triggered reporting tests for FR1 without SSB time index detection when DRX is used for UE configured with highSpeedMeasInterFreq-r17

##### A.6.6.2.12.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when UE is configured with *highSpeedMeasInterFreq-r17*. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3.4.

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. The test parameters are given in Tables A.6.6.2.12.1-1, A.6.6.2.12.1-2 and A.6.6.2.12.1-3.

Measurement gap pattern configuration is defined in Table A.6.6.2.12.1-2. 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.

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. Furthermore, UE is allocated with PUSCH resource at every DRX cycle.

Table A.6.6.2.12.1-1: 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 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.6.6.2.12.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection for UE configured with *highSpeedMeasInterFreq-r17*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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. |
| Gap Pattern Id |  | Config 1,2,3 | 0  4 | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1,2,3 | 9 |  |
| 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 | DRX.14 | As specified in clause A.3.3 |
| 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 | 2.3 |  |

Table A.6.6.2.12.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection for UE configured with *highSpeedMeasInterFreq-r17*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |  | Config 1, 2, 3 | 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 | | | | NA | | |
|  | |  | Config 2 | SR.1.1 TDD | | | | NA | | |
|  | |  | Config 3 | SR2.1 TDD | | | | NA | | |
| RMSI CORESET Reference Channel | |  | Config 1 | CR.1.1 FDD | | | | NA | | |
|  | |  | Config 2 | CR.1.1 TDD | | | | NA | | |
|  | |  | Config 3 | CR.2.1 TDD | | | | NA | | |
| Dedicated CORESET Reference Channel | |  | Config 1 | CCR.1.1 FDD | | | | NA | | |
|  | Config 2 | CCR.1.1 TDD | | | | NA | | |
|  | Config 3 | CCR.2.1 TDD | | | | NA | | |
| 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 | Config 1,2,3 | -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 | 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 | -62.2 | |
|  | | dBm/38.16MHz | Config 3 | -58.49 | -58.49 | | | -63.94 | -56.15 | |
| Propagation Condition | |  | Config 1,2 | AWGN | | | AWGN 1944Hz Note 5 | | | |
| Config 3 | AWGN | | | AWGN 3334Hz Note 6 | | | |
| 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.  Note 5: The AWGN 1944 Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 1944Hz.  Note 6: The AWGN 3334 Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 3334Hz. | | | | | | | | | | |

##### A.6.6.2.12.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 2240 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%.

UE is not required to report SSB time index.

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 4>