**3GPP TSG-RAN WG4 Meeting #111 *R4-2409728***

Fukuoka, Japan, May 20 – May 24, 2024

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** |  | **rev** |  | **Current version:** | **18.5.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| --- |
|  |
| ***Title:***  | draftCR on TC2 for MUSIM |
|  |  |
| ***Source to WG:*** | MediaTek inc. |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_DualTxRx\_MUSIM-Perf |  | ***Date:*** | 2024-05-05 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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 canbe 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:*** | Based on the agreed test cases in RAN4#110-bis (R4-2406435), the following TC for R18 MUSIM is introduced:

|  |  |  |
| --- | --- | --- |
| No. | Test case | Volunteer company |
| TC2 | Inter-frequency event triggered reporting, 1 Type-2 gap + 2 periodic MUSIM gap, with partially partial overlapping among all configured gaps, Type-2 gap has lowest priority, priority based solution, SSB-based measurements, FR2. | MTK |

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|  |  |
| ***Summary of change:*** | The above TC is introduced |
|  |  |
| ***Consequences if not approved:*** | Testing R18 MUSIM will be incomplete |
|  |  |
| ***Clauses affected:*** | New (A.7.6.2.X) |
|  |  |
|  | **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.7.6.2.X SA event triggered reporting tests for FR2 with a measurement gap and two periodic MUSIM gaps configured

##### A.7.6.2.X.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event on an inter-frequency layer based on measurement performed within a measurement gap, and when the UE is configured with two periodic MUSIM gaps. 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 FR2 on NR RF channel 1 and NR cell 2 as neighbour cell in FR2 on NR RF channel 2. The test parameters and configurations are given in Tables A.7.6.2.X.1-1, A.7.6.2.X.1-2, and A.7.6.2.X.1-3.

The three gaps, including measurement gap and two periodic MUSIM gaps, are configured with different priority levels. In this test, measurement gap has the lowest priority level, and the 2nd MUSIM gap has the highest priority level (i.e., priority of 2nd MUSIM gap > 1st MUSIM gap > measurement gap) as defined in Table A.7.6.2.X.1-2.

Note: the signaling procedure to trigger the UE to request MUSIM gaps before the test equipment configures MUSIM gaps to the UE is left to comformance test implementation and is not defined in this test case.

Measurement gap pattern configuration defined in Table A.7.6.2.X.1-2 is provided for a UE that does not support per-FR gap, and no gap pattern (Gap Pattern Id and Measurement gap offset) is configured for a UE capable of per-FR gap.

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.

Supported test configurations are shown in table A.7.6.2.X.1-1.

Table A.7.6.2.X.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.7.6.2.X.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 | 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 | NR cell 2 is on NR RF channel number 2. |
| Gap Pattern Id |  | Config 1 | 13 | As specified in clause 9.1.2-1. |
| Measurement gap offset | ms | Config 1 | 17 |  |
| Measurement gap priority |  | Config 1 | 3 | Lowest priority level |
| 1st MUSIM gap Pattern Id |  | Config 1 | 0 | As specified in Table 9.1.10-1 |
| 1st MUSIM gap offset | ms | Config 1 | 10 |  |
| 1st MUSIM gap priority |  | Config 1 | 2 | Second priority level |
| 2nd MUSIM gap Pattern Id |  | Config 1 | 1 | As specified in Table 9.1.10-1 |
| 2nd MUSIM gap offset | ms | Config 1 | 3 |  |
| 2nd MUSIM gap priority |  | Config 1 | 1 | Highest priority level |
| 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 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 serving and neighbour cells |  | Config 1 | 3μs | Synchronous cells. |
| T1 | s | Config 1 | 5 |  |
| T2 | s | Config 1 | 10.4 for PC1; 6.5 for other PC |  |

Table A.7.6.2.X.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 |
|  |  |  | T1 | T2 | T1 | T2 |
| AoA setup |  | Config 1 | Setup 3 as specified in clause A.3.15 |
|  |  |  | AoA1 | AoA2 |
| Beam AssumptionNote 7 |  | 1,2 | Rough | Rough |
| NR RF Channel Number |  | Config 1 | 1 | 2 |
| Duplex mode |  | Config 1 | TDD | TDD |
| TDD configuration |  | Config 1 | TDDConf.3.1 | TDDConf.3.1 |
| BWchannel | MHz | Config 1 | 100: NRB,c = 66 | 100: NRB,c = 66 |
| Data RBs allocated |  | Config 1 | 66 | 66 |
| BWP BW | MHz | Config 1 | 100: NRB,c = 66 | 100: NRB,c = 66 |
| BWP configuration | Initial DL BWP |  | Config 1 | DLBWP.0.1 | N/A |
|  | Initial UL BWP |  |  | ULBWP.0.1 | N/A |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | N/A |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | N/A |
| OCNG Patterns defined in A.3.2.1.1 (OP.1)  |  | Config 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.3.11.2 |  | Config 1 | SMTC.1 | SMTC.1 |
| PDSCH/PDCCH subcarrier spacing | kHz | Config 1 | 120 | 120 |
| TRS configuration |  | Config 1 | TRS.2.1 TDD | N/A |
| PDSCH/PDCCH TCI state |  | Config 1 | TCI.State.2 | 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 |
| 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 |
| SSBRP Note 3 | dBm/SCS Note5 | Config 1 | -87 | -87 | -Infinity | -87 |
|  BB Note 8 | dB | Config 1 | 1.89 | 1.89 | -Infinity | 1.89 |
| IoNote3 | dBm/95.04 MHz Note5 | Config 1 | -58.01 | -58.01 | -Infinity | -58.01 |
| Propagation Condition  |  | Config 1 | No external noise (Note 9) | No external noise (Note 9) |
| 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: VoidNote 3: SSBRP, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.Note 4: VoidNote 5: Equivalent power received by an antenna with 0 dBi gain at the centre of the quiet zoneNote 6: As observed with 0 dBi gain antenna at the centre of the quiet zoneNote 7: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementationNote 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.Note 9: The downlink connection between the System Simulator and the UE is without Additive White Gaussian Noise, and has no fading or multipath effects as specified in TS 38.521-2 B.0 [40]. |

##### A.7.6.2.X.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

10240 for UE supporting power class 1, 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%.

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 CHANGES 1----------------------------**