**3GPP TSG-RAN WG4 Meeting # 98-bis-e R4-2105723**

**Electronic Meeting, Apr. 12-20, 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **Draft** | **rev** |  | **Current version:** | **16.7.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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:*** | Draft CR of test cases for PSCell addition and release for NR-U | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_unlic-Perf | | | | |  | ***Date:*** | | | 2021-03-01 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The Draft CR is based on the endorsed CR R4-2103532. The new changes are using “additional changes for RAN4#98-bis-e”   * Some configurations shall be added or updated according to the new configurations introduced for NR-U. * Exceeding Lmax shall be avoided. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Add and update some configurations according to the agreements in RAN4#98e meeting. * Add a note that the test shall not be considered in statistics when exceeding Lmax. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The test cases are incomplete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.10.3.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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.10.3.6 PSCell addition and release delay

#### A.10.3.6.1 Addition and Release Delay of known NR PSCell on the carrier under CCA

##### A.10.3.6.1.1 Test purpose and environment

The purpose of this test is to verify that the NR PSCell addition and release delays on the carrier under CCA under EN-DC are within the requirements stated in clause 7.31A.2 [15] for the case when the PSCell is known by the UE at the time of addition.

Supported test configurations are shown in A.10.3.6.1.1-1. The test parameters for the E-UTRA cell are given in Table A.3.7.2.1-1. The E-UTRA cell once set up is not changed across time.

The test parameters for NR cell are given in Tables A.10.3.6.1.1-2 and cell-specific parameters in A.10.3.6.1.1-3 below. The test consists of five successive time periods with duration of T1, T2, T3, T4 and T5 respectively. There are two carriers each with one cell. Before the test starts the UE is connected to Cell 1 (E-UTRA PCell) on radio channel 1 (PCC) but is not aware of Cell 2 (NR PSCell) on radio channel 2. The UE is only monitoring the PCC. During T1 only Cell1 is known to the UE.

Before the start of T2, the UE in the measurement control information that event-triggered reporting with Event A4 is configured for neighbour cell (Cell2). Before the start of T2 the UE is configured with the measurement gaps (gap pattern Id # 0). The Cell2 becomes known to the UE during T2. Therefore, during T2 the UE shall report Event A4. After receiving the Event A4, the test system shall send a RRC message to the UE to release the measurement gaps.

The test system shall send a RRC message to the UE to add PSCell (Cell 2) on radio channel 2. The RRC message (to add PSCell) also includes a request for the UE to start periodic CSI reporting for the PSCell after the PSCell has been successfully added. The RRC message to add PSCell shall be sent to the UE during period T2, after the measurement gaps are released by the test system. The point in time at which the RRC message to add PSCell (Cell2) is received at the UE antenna connector defines the start of period T3.

The test system shall observe the periodic reporting of CSI for PSCell during T4. The point in time at which the UE has sent PRACH to the PSCell (Cell 2) defines the start of period T4.

The test system shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2. The RRC message to release PSCell (Cell2) shall be sent to the UE during period T4, after the UE has sent at least one CQI report with non-zero CQI index for PSCell (Cell 2). The point in time at which the RRC message to release PSCell (Cell2) is received at the UE antenna connector defines the start of period T5.

Table A.10.3.6.1.1-1: Supported test configurations for FR1 PSCell

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | LTE FDD, NR SCS 30 kHz, BW 40 MHz, TDD |
| 2 | LTE TDD, NR SCS 30 kHz, BW 40 MHz, TDD |
| Note: The UE is only required to pass in one of the supported test configurations in FR1 | |

Table A.10.3.6.1.1-2: General Test Parameters for PSCell Addition and Release

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Value | Comment |
| RF Channel Number | |  | 1, 2 | Two radio channels are used for this test. One for E-UTRA cell and second for NR Cell on the carrier under CCA |
| Initial | Active PCell |  | Cell1 | PCell on RF channel number 1. |
|  | Neighbour cell |  | Cell2 | Neighbour cell on RF channel number 2. |
| Final | Active PCell |  | Cell1 | PCell on RF channel number 1. |
| Condition | Neighbour Cell |  | Cell2 | PSCell released on RF channel number 2. |
| B1 | Hysteresis | dB | 0 | Hysteresis for evaluation of event B1. |
|  | Threshold RSRP | dBm | -93 | Actual RSRP threshold for event B1. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin. |
|  | Time to Trigger | S | 0 |  |
| DRX | |  | OFF | Continuous monitoring of primary cell |
| DL CCA model | |  |  | As specified in clause A.3.20.2.1 |
| UL CCA model | |  |  | As specified in clause A.3.20.2.2 |
| Measurement gap pattern Id | |  | 0 | Gaps are configured before T2 and released before T3. |
| PRACH configuration on cell2 | |  | FR1 PRACH configuration 2 | Captured in A.3.8.2.1 |
| CQI/PMI periodicity and offset configuration index on cell2 | |  | 2ms | CQI reporting for PSCell every uplink subframe |
| Cell-individual offset for cells on RF channel number 1 | | dB | 0 | Individual offset for cells on primary component carrier. |
| Cell-individual offset for cells on RF channel number 2 | | dB | 0 | Individual offset for cells on carrier frequency of cell2. |
| T1 | | s | 1 | During this time the PCell shall be known and cell2 shall be unknown. |
| T2 | | s | ≥ Tidentify\_irat\_cca\_without\_index | Tidentify\_irat\_cca\_without\_index is defined in clause 8.1.2.4.21A and 8.1.2.4.22A in TS 36.133  During this time the UE shall identify neighbour cell (cell2) and report event B1. |
| T3 | | s | ≥ Tconfig\_PSCell\_withCCA | During this time the UE adds the PSCell. Tconfig\_PSCell\_withCCA  is defined in clause 7.31A.2 |
| T4 | | s | 0.5 | During this time the UE sends CSI reports for PSCell. |
| T5 | | s | 0.5 | During this time the UE releases the PSCell. |

Table A.10.3.6.1.1-3: Cell Specific Parameters for PSCell Addition and Release

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Config | Test | | | | |
|  |  |  | T1 | T2 | T3 | T4 | T5 |
| PCCA\_DL |  |  | [TBD] | [TBD] | [TBD] | [TBD] | [TBD] |
| PCCA\_UL |  |  | [TBD] | [TBD] | [TBD] | [TBD] | [TBD] |
| E-UTRA RF Channel Number |  | 1,2 | 1 | | | | |
| NR RF Channel Number |  | 1,2 | 2 | | | | |
| TDD configuration |  | 1,2 | TDDConf.1.1 CCA | | | | |
| BWchannel |  | 1,2 | 40: NRB,c = 106 | | | | |
| Initial BWP Configuration |  | 1,2 | DLBWP.0.1  ULBWP.0.1 | | | | |
| Dedicated BWP Configuration |  | 1,2 | DLBWP.1.1  ULBWP.1.1 | | | | |
| PDSCH Reference |  | 1,2 | SR1.1 CCA | | | | |
| RMSI CORESET Reference |  | 1,2 | CR1.1 CCA | | | | |
| Dedicated CORESET Reference |  | 1,2 | CR1.1 CCA | | | | |
| OCNG Patterns |  | 1,2 | OP.1 | | | | |
| DBT window configuration |  | 1, 2 | DBT.1 | | | | |
| SSB configuration |  | 1, 2 | SSB.1 CCA | | | | |
| SMTC configuration |  | 1,2 | SMTC.1 | | | | |
| TRS Configuration |  | 1,2 | TRS.1.2 TDD | | | | |
| 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 | dB | 1,2 | 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/15 kHz | 1,2 | N/A | -85 | | | |
| Note2 | dBm/SCS | 1,2 | N/A | -82 | | | |
|  |  | 1,2 | -infinity | 0 | | | |
|  |  | 1,2 | -infinity | 0 | | | |
| SS-RSRPNote3 | dBm/SCS | 1,2 | -infinity | -82 | | | |
| IoNote3 | dBm/38.1MHz | 1,2 | N/A | -51 | | | |
| Propagation condition |  | 1,2 | 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. For cells with CCA model, OCNG is transmitted only in slots with RMC burst transmission and is not transmitted during muted slots or during DBT windows.  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.10.3.6.1.2 Test Requirements

The UE shall transmit the PRACH to PSCell at latest Tconfig\_PSCell\_withCCA Note1 into T3.

The UE shall send at least one CSI report for PSCell with non-zero CQI index during T4.

The UE shall periodically send CSI reports for PSCell after the UE has sent first CQI report with non-zero CQI index during T4

The UE shall stop sending CSI reports for PSCell in at latest 20 ms into T5.

All the above test requirements shall be fulfilled in order for the observed PSCell addition delay and PSCell release delay to be counted as correct. The rate of correct observed PSCell addition delay and PSCell release delay during repeated tests shall be at least 90%.

Note1: The PSCell addition delay can be expressed as follows as specified in clause 7.31A.2 [15]:

Tconfig\_PSCell\_withCCA = TRRC\_delay + Tprocessing + Tsearch\_withCCA + T∆\_withCCA + TPSCell\_ DU\_withCCA + 2 ms

Where:

TRRC\_delay = 20 ms

Tprocessing = 20 ms

Tsearch\_withCCA = 0

T∆\_withCCA = (1+ L2)\*20 ms

L2 is the number of SMTC occasions not available at the UE for fine time tracking and acquiring full timing information. TPSCell\_ DU\_withCCA = TPSCell\_ DU  + ΔPRACH  as defined in 7.31A.2 TS36.133.

### <End of Change 1>