3GPP TSG-RAN WG4 Meeting # 111 R4-2407978

Fukuoka City, Fukuoka , Japan, 20th – 24th May, 2024

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | 4424 | **rev** |  | **Current version:** | **15.25.0** |  |
|  |
| *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\_newRAT-Perf) R15 SUL test setup correction |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | NR\_newRAT-Perf |  | ***Date:*** | 2024-05-10 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | 5 |
|  | *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:*** | Note: same changes apply to A.4.5.4.1 and A.6.5.4.1Change 1: NR UL and SUL can’t be scheduled at the same time according to 38.300 “*SUL differs from the aggregated uplink in that the UE may be scheduled to transmit either on the supplementary uplink or on the uplink of the carrier being supplemented, but not on both at the same time*.” But in this test, starting T2 “*UE shall start transmission both on the NR uplink and supplementary uplink*” which is contradict to 38.300. The proposal is to keep supplementary uplink transmission.Change 2: In 38.331 clause 6.3.1, SUL assess is specified as:rsrp-ThresholdSSB-SUL RSRP-Range OPTIONAL, -- Cond SUL*;*

|  |  |
| --- | --- |
| *SUL* | The field is mandatory present in *initialUplinkBWP* if *supplementaryUplink* is configured in *ServingCellConfigCommonSIB* or if *supplementaryUplinkConfig* is configured in *ServingCellConfigCommon*; otherwise, the field is absent. |

Therefore, in test 2 *rsrp-ThresholdSSB-SUL* has to be configured. Change 3: SUL is configured without UL in test 2. However it’s infeasible as specified in 38.331. Therefore, the test 2 should be removed.***supplementaryUplinkConfig***The network configures this field only if *uplinkConfigCommon* is configured. If this field is absent, the UE shall release the *supplementaryUplinkConfig* and the *supplementaryUplink* configured in *ServingCellConfig* of this serving cell, if configured. |
|  |  |
| ***Summary of change:*** | Change 1: UE is transmitting on SUL only instead of both NR UL and SULChange 2: Configure *rsrp-ThresholdSSB-SUL*.Change 3: Remove test 2 |
|  |  |
| ***Consequences if not approved:*** | Wrong test setup |
|  |  |
| ***Clauses affected:*** | A.4.5.4.1, A.6.5.4.1 |
|  |  |
|  | **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.4.5.4.1 UE UL carrier RRC reconfiguration Delay

Table A.4.5.4.1-1 - Table A.4.5.4.1-4 : Void

##### A.4.5.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that when the UE receives a RRC message implying NR UL or Supplementary UL carrier configuration, the UE shall be ready to start transmission on the newly configured carrier within the time limits specified in clause 8.4.2 and 8.4.3 for configuring and deconfiguring, respectively.

There are three cells: E-UTRAN PCell (Cell 1), FR1 PSCell (Cell 2) and FR1 SCell (Cell 3). For SCell, both NR uplink and supplementary uplink are broadcast by *ServingCellConfigCommonSIB.* The test parameters for PSCell and SCell are given in Table A. 4.5.4.1.1-1, Table A. 4.5.4.1.1-2, Table A. 4.5.4.1.1-3 and Table A. 4.5.4.1.1-4 below. The test parameters and applicability for E-UTRAN PCell are defined in A.3.7.2. The test consists two tests. The test consists of three time periods, with duration of T1, T2 and T3 respectively. During time duration T1, NR uplink of cell 3 is configured to UE*.* At the start of T2, a supplementary uplink of cell3 is configured to UE through *RRCReconfiguration*, then UE shall start transmission on the supplementary uplink. At the start of T3, the supplementary uplink is released through *RRCReconfiguration*.

Table A.4.5.4.1.1-1: Supported test configurations

|  |  |  |
| --- | --- | --- |
| Configuration | PSCell (Cell2) | SCell (Cell3) |
| 1 | 15 kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode | DL and UL: 15kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode;SUL: 15kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 2 | 15 kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode | DL and UL: 15kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode;SUL: 15kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 3 | 15 kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode | DL and UL: 30kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode;SUL: 30kHz SCS, ≥40 MHz bandwidth, SUL duplex mode |
| 4 | 15 kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode | DL and UL: 15kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode;SUL: 15kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 5 | 15 kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode | DL and UL: 15kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode;SUL: 15kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 6 | 15 kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode | DL and UL: 30kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode;SUL: 30kHz SCS, ≥40 MHz bandwidth, SUL duplex mode |
| 7 | 30 kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode | DL and UL: 15kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode;SUL: 15kHz SCS, 10 MHz bandwidth, SUL duplex mode |
| 8 | 30 kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode | DL and UL: 15kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode;SUL: 15kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 9 | 30 kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode | DL and UL: 30kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode;SUL: 30kHz SCS, ≥40 MHz bandwidth, SUL duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurationsNote 2 The UE is only required to be tested in one with smallest aggregated channel bandwidth from supported band combinations which is composed of CCs ≥ the bandwidth (BWchannel) defined in each test configuration, |

Table A.4.5.4.1.1-2: General test parameters for EN-DC UE UL carrier RRC reconfiguration Delay

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| RF Channel Number |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 1, 2, 3 | Three radio channels are used for this test. |
| Active cell |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | Cell 1: E-UTRAN PCellCell 2: FR1 PSCellCell 3: FR1 SCell | E-UTRAN PCell on RF channel number 1FR1 PSCell on RF channel number 2FR1 SCell on RF channel number 3 |
| CP length |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | Normal |  |
| DRX |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | OFF |  |
| Measurement gap pattern Id |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | OFF |  |
| Filter coefficient |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 0 | L3 filtering is not used |
| T1 | s | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 5 |  |
| T2 | s | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 5 |  |
| T3 | s | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 5 |  |

Table A.4.5.4.1.1-3: NR Cell specific test parameters for EN-DC UE UL carrier RRC reconfiguration Delay on PSCell (Cell 2)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test Configuration | Test 1 |  |
| T1 | T2 | T3 |  |  |  |
| Channel number |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 2 |  |
| TDD configuration |  | Conf 1, 2, 3 | N/A |  |
| Conf 4, 5, 6 | TDD Conf.1.1 |  |
| Conf 7, 8, 9 | TDD Conf.2.1 |  |
| BWchannel | MHz | Conf 1, 2, 3 | Note 6 |  |
| Conf 4, 5, 6 | Note 6 |  |
| Conf 7, 8, 9 | Note 6 |  |
| BWoccupied | RB | Conf 1, 2, 3 | 52 Note 4 |  |
|  |  | Conf 4, 5, 6 | 52 Note 4 |  |
|  |  | Conf 7, 8, 9 | 106 Note 5 |  |
| PDSCH reference measurement channel as defined in A.3.1.1 |  | Conf 1, 2, 3 | SR.1.1 FDD  |  |
| Conf 4, 5, 6 | SR.1.1 TDD |  |
| Conf 7, 8, 9 | SR 2.1 TDD |  |
| RMSI CORESET reference measurement channel as defined in A.3.1.2 |  | Conf 1, 2, 3 | CR.1.1 FDD  |  |
| Conf 4, 5, 6 | CR.1.1 TDD |  |
| Conf 7, 8, 9 | CR.2.1 TDD |  |
| RMC CORESET reference measurement channel as defined in A.3.1.3 |  | Conf 1, 2, 3 | CCR.1.1 FDD  |  |
| Conf 4, 5, 6 | CCR.1.1 TDD |  |
| Conf 7, 8, 9 | CCR.2.1 TDD |  |
| OCNG Pattern Note 1 |  | Conf 1, 2, 3, 4, 5, 6 | OP.1 Note 4 |  |
|  |  | Config 7, 8, 9 | OP.1 Note 5 |  |
| SSB configuration |  | Conf 1, 2, 3, 4, 5, 6 | SSB.1 FR1  |  |
| Conf 7, 8, 9 | SSB.2 FR1  |  |
| SMTC configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | SMTC.1 |  |
| CSI-RS for tracking |  | Conf 1 | TRS.1.1 FDD |  |
|  | Conf 2 | TRS.1.1 FDD |  |
|  | Conf 3 | TRS.1.1 FDD |  |
|  | Conf 4 | TRS.1.1 TDD |  |
|  | Conf 5 | TRS.1.1 TDD |  |
|  | Conf 6 | TRS.1.1 TDD |  |
|  | Conf 7 | TRS.1.2 TDD |  |
|  | Conf 8 | TRS.1.2 TDD |  |
|  | Conf 9 | TRS.1.2 TDD |  |
| DL initial BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | DLBWP.0.1 |  |
| DL dedicated BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | DLBWP.1.1 |  |
| UL dedicated BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | ULBWP.1.1 |  |
| EPRE ratio of PSS to SSS | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 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 |
|  Note 2 | dBm / 15kHz | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | -102 |  |
| dBm/ SCS | Conf 1,2,3,4,5,6  | -102 |  |
| Conf 7,8,9 | -99 |  |
|  | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 16 | 16 | 16 |  |  |  |
|  Note 3 | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 16 | 16 | 16 |  |  |  |
| SS-RSRP Note 3 | dBm/ SCS | Conf 1,2,3,4,5,6  | -86 | -86 | -86 |  |  |  |
| Conf 7,8,9 | -83 | -83 | -83 |  |  |  |
| Io Note 3 | dBm/ 9.36 MHz | Conf 1,2,3,4,5,6  | -57.9 | -57.9 | -57.9 |  |  |  |
| dBm/ 38.16MHz | Conf 7,8,9 | -51.8 | -51.8 | -51.8 |  |  |  |
| Propagation Condition  |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | AWGN |  |
| Antenna configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 1 x 2 |  |
| 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 within BWoccupied.NOTE 3: , Io, and SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.NOTE 4: All UL/DL transmission shall be confined within BWoccupied (i.e. 10 MHz, 52 RBs) from FC,low, and Io is independent of the BWchannel configured.NOTE 5: All UL/DL transmission shall be confined within BWoccupied (i.e. 40 MHz, 106 RBs) from FC,low, and Io is independent of the BWchannel configured.NOTE 6: NRB,c. is derived from Table 5.3.2-1 in TS38.101-1[2] with configured BWchannel. |

Table A.4.5.4.1.1-4: NR Cell specific test parameters for EN-DC UE UL carrier RRC reconfiguration Delay on SCell (Cell 3)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test Configuration | Test 1 |  |
| T1 | T2 | T3 |  |  |  |
| Channel number |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 3 |  |
| TDD configuration |  | Conf 1, 4, 7 | N/A |  |
| Conf 2, 5, 8 | TDDConf.1.1 |  |
| Conf 3, 6, 9 | TDDConf.2.1 |  |
| BWchannel | MHz | Conf 1, 4, 7 | Note 6 |  |
| Conf 2, 5, 8 | Note 6 |  |
| Conf 3, 6, 9 | Note 6 |  |
| BWoccupied | RB | Conf 1, 4, 7 | 52 Note 4 |  |
|  |  | Conf 2, 5, 8 | 52 Note 4 |  |
|  |  | Conf 3, 6, 9 | 106 Note 5 |  |
| PUSCH parameters for NR UL carrier |  | Conf 1, 4, 7 | G-FR1-A3-10 in [13] | G-FR1-A3-10 in [13] | G-FR1-A3-10 in [13] |  |  |  |
| Conf 2, 5, 8 | G-FR1-A3-10 in [13] | G-FR1-A3-10 in [13] | G-FR1-A3-10 in [13] |  |  |  |
| Conf 3, 6, 9 | G-FR1-A3-14 in [13] | G-FR1-A3-14 in [13] | G-FR1-A3-14 in [13] |  |  |  |
| PUCCH parametersFor NR UL carrier |  | Conf 1, 4, 7 | Table 8.3.3.1.2-1 in [13]  | Table 8.3.3.1.2-1 in [13] | Table 8.3.3.1.2-1 in [13] |  |  |  |
| Conf 2, 5, 8 | Table 8.3.3.1.2-1 in [13]  | Table 8.3.3.1.2-1 in [13] | Table 8.3.3.1.2-1 in [13] |  |  |  |
| Conf 3, 6, 9 | Table 8.3.3.1.2-2 in [13]  | Table 8.3.3.1.2-2 in [13] | Table 8.3.3.1.2-2 in [13] |  |  |  |
| PUSCH parameters for supplementary UL |  | Conf 1, 4, 7 | N/A | G-FR1-A3-10 in [13] | N/A |  |  |  |
| Conf 2, 5, 8 | N/A | G-FR1-A3-10 in [13] | N/A |  |  |  |
| Conf 3, 6, 9 | N/A | G-FR1-A3-14 in [13] | N/A |  |  |  |
| PUCCH parameters for supplementary UL |  | Conf 1, 4, 7 | N/A | N/A | N/A |  |  |  |
| Conf 2, 5, 8 | N/A | N/A | N/A |  |  |  |
| Conf 3, 6, 9 | N/A | N/A | N/A |  |  |  |
| PDSCH reference measurement channel as defined in A.3.1.1 |  | Conf 1, 4, 7 | SR.1.1 FDD |  |
| Conf 2, 5, 8 | SR.1.1 TDD |  |
| Conf 3, 6, 9 | SR 2.1 TDD |  |
| RMSI CORESET reference measurement channel as defined in A.3.1.2 |  | Conf 1, 4, 7 | CR.1.1 FDD |  |
| Conf 2, 5, 8 | CR.1.1 TDD |  |
| Conf 3, 6, 9 | CR.2.1 TDD |  |
| RMC CORESET reference measurement channel as defined in A.3.1.3 |  | Conf 1, 4, 7 | CCR.1.1 FDD |  |
| Conf 2, 5, 8 | CCR.1.1 TDD |  |
| Conf 3, 6, 9 | CCR.2.1 TDD |  |
| OCNG Pattern Note 1 |  | Conf 1, 2, 4, 5, 7, 8 | OP.1 Note 4 |  |
|  |  | Conf 3, 6, 9 | OP.1 Note 5 |  |
| SSB configuration |  | Conf 1, 2, 4, 5, 7,8 | SSB.1 FR1 |  |
| Conf 3, 6, 9 | SSB.2 FR1 |  |
| SMTC configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | SMTC.1 |  |
| CSI-RS for tracking |  | Conf 1 | TRS.1.1 FDD |  |
|  | Conf 2 | TRS.1.1 TDD |  |
|  | Conf 3 | TRS.1.2 TDD |  |
|  | Conf 4 | TRS.1.1 FDD |  |
|  | Conf 5 | TRS.1.1 TDD |  |
|  | Conf 6 | TRS.1.2 TDD |  |
|  | Conf 7 | TRS.1.1 FDD |  |
|  | Conf 8 | TRS.1.1 TDD |  |
|  | Conf 9 | TRS.1.2 TDD |  |
| DL initial BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | DLBWP.0.1 |  |
| DL dedicated BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | DLBWP.1.1 |  |
| UL dedicated BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | ULBWP.1.1 |  |
| EPRE ratio of PSS to SSS | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 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 |
|  Note 2 | dBm / 15kHz | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | -102 |  |
| dBm/ SCS | Conf 1, 2, 4, 5, 7,8 | -102 |  |
| Conf 3, 6, 9 | -99 |  |
|  | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 16 | 16 | 16 |  |  |  |
|  Note 3 | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 16 | 16 | 16 |  |  |  |
| SS-RSRP Note 3 | dBm/ SCS | Conf 1, 2, 4, 5, 7,8 | -86 | -86 | -86 |  |  |  |
| Conf 3, 6, 9 | -83 | -83 | -83 |  |  |  |
| Io Note 3 | dBm/ 9.36 MHz | Conf 1, 2, 4, 5, 7,8 | -57.9 | -57.9 | -57.9 |  |  |  |
| dBm/ 38.16MHz | Conf 3, 6, 9 | -51.8 | -51.8 | -51.8 |  |  |  |
| Propagation Condition  |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | AWGN |  |
| Antenna configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 1 x 2 |  |
| SUL RSRP threshold (*rsrp-ThresholdSSB-SUL*) | dBm | Conf 1,2,3,4,5,6  | -75 |  |
|  |  | Conf 7,8,9 | -72 |  |
| 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 within BWoccupied.NOTE 3: , Io, and SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.NOTE 4: All UL/DL transmission shall be confined within BWoccupied (i.e. 10 MHz, 52 RBs) from FC,low, and Io is independent of the BWchannel configured.NOTE 5: All UL/DL transmission shall be confined within BWoccupied (i.e. 40 MHz, 106 RBs) from FC,low, and Io is independent of the BWchannel configured.NOTE 6: NRB,c. is derived from Table 5.3.2-1 in TS38.101-1[2] with configured BWchannel. |

##### A.4.5.4.1.2 Test Requirements

The UE shall be ready to start transmission on the supplementary uplink carrier on SCell within 20ms from the start of T2.

The UE shall stop the transmission on the supplementary uplink carrier on SCell within 20ms from the start of T3.

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

### <End of Change 1>

### <Start of Change 2>

#### A.6.5.4.1 UE UL carrier RRC reconfiguration Delay

Table A.6.5.4.1-1 - Table A.6.5.4.1-4 : Void

##### A.6.5.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that when the UE receives a RRC message implying NR UL or Supplementary UL carrier configuration, the UE shall be ready to start transmission on the newly configured carrier within the time limits specified in clause 8.4.2 and 8.4.3 for configuring and deconfiguring, respectively.

There are two cells: FR1 PCell (cell 1) and FR1 SCell (cell 2). Both NR uplink and supplementary uplink are broadcast by *ServingCellConfigCommonSIB.* The test parameters for PCell and SCell are given in Table A. 6.5.4.1.1-1, Table A.6.5.4.1.1-2, Table A.6.5.4.1.1-3 and Table A.6.5.4.1.1-4 below. The test consists of three time periods, with duration of T1, T2 and T3 respectively. During time duration T1, NR uplink of cell 2 is configured to UE*.* At the start of T2, a supplementary uplink of cell 2 is configured to UE through *RRCReconfiguration*, then UE shall start transmission on the supplementary uplink. At the start of T3, the supplementary uplink is released through *RRCReconfiguration*.

Table A.6.5.4.1.1-1: Supported test configurations

|  |  |  |
| --- | --- | --- |
| **Configuration** | **PCell (Cell 1)** | **SCell (Cell 2)** |
| 1 | 15 kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode | DL and UL: 15 kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode;SUL: 15 kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 2 | 15 kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode | DL and UL: 15 kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode;SUL: 15 kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 3 | 15 kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode | DL and UL: 30kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode;SUL: 30kHz SCS, ≥40 MHz bandwidth, SUL duplex mode |
| 4 | 15 kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode | DL and UL: 15 kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode;SUL: 15 kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 5 | 15 kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode | DL and UL: 15 kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode;SUL: 15 kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 6 | 15 kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode | DL and UL: 30kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode;SUL: 30kHz SCS, ≥40 MHz bandwidth, SUL duplex mode |
| 7 | 30 kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode | DL and UL: 15 kHz SSB SCS, ≥10 MHz bandwidth, FDD duplex mode;SUL: 15 kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 8 | 30 kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode | DL and UL: 15 kHz SSB SCS, ≥10 MHz bandwidth, TDD duplex mode;SUL: 15 kHz SCS, ≥10 MHz bandwidth, SUL duplex mode |
| 9 | 30 kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode | DL and UL: 30kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode;SUL: 30kHz SCS, ≥40 MHz bandwidth, SUL duplex mode |
| Note 1: The UE is only required to be tested in one of the supported test configurationsNote 2: The UE is only required to be tested in one with smallest aggregated channel bandwidth from supported band combinations which is composed of CCs ≥ the bandwidth (BWchannel) defined in each test configuration, |

Table A.6.5.4.1.1-2: General test parameters for NR standalone UE UL carrier RRC reconfiguration Delay on Pcell

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| RF Channel Number |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 1, 2 | Two radio channels are used for this test. |
| Active cell |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | Cell 1: FR1 PCellCell 2: FR1 SCell | PCell on RF channel number 1FR1 SCell on RF channel number 2 |
| CP length |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | Normal |  |
| DRX |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | OFF |  |
| Measurement gap pattern Id |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | OFF |  |
| Filter coefficient |  | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 0 | L3 filtering is not used |
| T1 | s | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 5 |  |
| T2 | s | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 5 |  |
| T3 | s | Config 1,2,3, 4, 5, 6, 7, 8, 9 | 5 |  |

Table A.6.5.4.1.1-3: NR Cell specific test parameters for NR standalone UE UL carrier RRC reconfiguration Delay on PCell (Cell 1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test Configuration** | **Test 1** |  |
| **T1** | **T2** | **T3** |  |  |  |
| Channel number |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 1 |  |
| TDD configuration |  | Conf 1, 2, 3 | N/A |  |
| Conf 4, 5, 6 | TDD Conf.1.1 |  |
| Conf 7, 8, 9 | TDD Conf.2.1 |  |
| BWchannel | MHz | Conf 1, 2, 3 | Note 6 |  |
| Conf 4, 5, 6 | Note 6 |  |
| Conf 7, 8, 9 | Note 6 |  |
| BWoccupied | RB | Conf 1, 2, 3 | 52 Note 4 |  |
|  |  | Conf 4, 5, 6 | 52 Note 4 |  |
|  |  | Conf 7, 8, 9 | 106 Note 5 |  |
| PDSCH reference measurement channel as defined in A.3.1.1 |  | Conf 1, 2, 3 | SR.1.1 FDD  |  |
| Conf 4, 5, 6 | SR.1.1 TDD |  |
| Conf 7, 8, 9 | SR 2.1 TDD |  |
| RMSI CORESET reference measurement channel as defined in A.3.1.2 |  | Conf 1, 2, 3 | CR.1.1 FDD  |  |
| Conf 4, 5, 6 | CR.1.1 TDD |  |
| Conf 7, 8, 9 | CR.2.1 TDD |  |
| RMC CORESET reference measurement channel as defined in A.3.1.3 |  | Conf 1, 2, 3 | CCR.1.1 FDD  |  |
| Conf 4, 5, 6 | CCR.1.1 TDD |  |
| Conf 7, 8, 9 | CCR.2.1 TDD |  |
| OCNG Pattern Note 1 |  | Conf 1, 2, 3, 4, 5, 6 | OP.1 Note 4 |  |
|  |  | Config 7, 8, 9 | OP.1 Note 5 |  |
| SSB configuration |  | Conf 1, 2, 3, 4, 5, 6 | SSB.1 FR1 |  |
| Conf 7, 8, 9 | SSB.2 FR1 |  |
| SMTC configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | SMTC.1 |  |
| CSI-RS for tracking |  | Conf 1 | TRS.1.1 FDD |  |
|  | Conf 2 | TRS.1.1 FDD |  |
|  | Conf 3 | TRS.1.1 FDD |  |
|  | Conf 4 | TRS.1.1 TDD |  |
|  | Conf 5 | TRS.1.1 TDD |  |
|  | Conf 6 | TRS.1.1 TDD |  |
|  | Conf 7 | TRS.1.2 TDD |  |
|  | Conf 8 | TRS.1.2 TDD |  |
|  | Conf 9 | TRS.1.2 TDD |  |
| DL initial BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | DLBWP.0.1 |  |
| DL dedicated BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | DLBWP.1.1 |  |
| UL dedicated BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | ULBWP.1.1 |  |
| EPRE ratio of PSS to SSS | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 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 |
|  Note 2 | dBm / 15kHz | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | -102 |  |
| dBm/ SCS | Conf 1,2,3,4,5,6  | -102 |  |
| Conf 7,8,9 | -99 |  |
|  | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 16 | 16 | 16 |  |  |  |
|  Note 3 | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 16 | 16 | 16 |  |  |  |
| SS-RSRP Note 3 | dBm/ SCS | Conf 1,2,3,4,5,6  | -86 | -86 | -86 |  |  |  |
| Conf 7,8,9 | -83 | -83 | -83 |  |  |  |
| Io Note 3 | dBm/ 9.36 MHz | Conf 1,2,3,4,5,6  | -57.9 | -57.9 | -57.9 |  |  |  |
| dBm/ 38.16MHz | Conf 7,8,9 | -51.8 | -51.8 | -51.8 |  |  |  |
| Propagation Condition  |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | AWGN |  |
| Antenna configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 1 x 2 |  |
| 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 within BWoccupied.NOTE 3: , Io, and SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.NOTE 4: All UL/DL transmission shall be confined within BWoccupied (i.e. 10 MHz, 52 RBs) from FC,low, and Io is independent of the BWchannel configured.NOTE 5: All UL/DL transmission shall be confined within BWoccupied (i.e. 40 MHz, 106 RBs) from FC,low, and Io is independent of the BWchannel configured.NOTE 6: NRB,c. is derived from Table 5.3.2-1 in TS38.101-1[2] with configured BWchannel. |

Table A.6.5.4.1.1-4: NR Cell specific test parameters for NR standalone UE UL carrier RRC reconfiguration Delay on SCell (Cell 2)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test Configuration** | **Test 1** |  |
| **T1** | **T2** | **T3** |  |  |  |
| Channel number |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 2 |  |
| TDD configuration |  | Conf 1, 4, 7 | N/A |  |
| Conf 2, 5, 8 | TDDConf.1.1 |  |
| Conf 3, 6, 9 | TDDConf.2.1 |  |
| BWchannel | MHz | Conf 1, 4, 7 | Note 6 |  |
| Conf 2, 5, 8 | Note 6 |  |
| Conf 3, 6, 9 | Note 6 |  |
| BWoccupied | RB | Conf 1, 4, 7 | 52 Note 4 |  |
|  |  | Conf 2, 5, 8 | 52 Note 4 |  |
|  |  | Conf 3, 6, 9 | 106 Note 5 |  |
| PUSCH parameters for NR UL carrier |  | Conf 1, 4, 7 | G-FR1-A3-10 in [13]  | G-FR1-A3-10 in [13]  | G-FR1-A3-10 in [13]  |  |  |  |
| Conf 2, 5, 8 | G-FR1-A3-10 in [13]  | G-FR1-A3-10 in [13]  | G-FR1-A3-10 in [13]  |  |  |  |
| Conf 3, 6, 9 | G-FR1-A3-14 in [13]  | G-FR1-A3-14 in [13]  | G-FR1-A3-14 in [13]  |  |  |  |
| PUCCH parametersFor NR UL carrier |  | Conf 1, 4, 7 | Table 8.3.3.1.2-1 in [13]  | Table 8.3.3.1.2-1 in [13]  | Table 8.3.3.1.2-1 in [13]  |  |  |  |
| Conf 2, 5, 8 | Table 8.3.3.1.2-1 in [13]  | Table 8.3.3.1.2-1 in [13]  | Table 8.3.3.1.2-1 in [13]  |  |  |  |
| Conf 3, 6, 9 | Table 8.3.3.1.2-2 in [13]  | Table 8.3.3.1.2-2 in [13]  | Table 8.3.3.1.2-2 in [13]  |  |  |  |
| PUSCH parameters for supplementary UL |  | Conf 1, 4, 7 | N/A | G-FR1-A3-10 in [13]  | N/A |  |  |  |
| Conf 2, 5, 8 | N/A | G-FR1-A3-10 in [13]  | N/A |  |  |  |
| Conf 3, 6, 9 | N/A | G-FR1-A3-14 in [13]  | N/A |  |  |  |
| PUCCH parameters for supplementary UL |  | Conf 1, 4, 7 | N/A | N/A  | N/A |  |  |  |
| Conf 2, 5, 8 | N/A | N/A | N/A |  |  |  |
| Conf 3, 6, 9 | N/A | N/A | N/A |  |  |  |
| PDSCH reference measurement channel as defined in A.3.1.1 |  | Conf 1, 4, 7 | SR.1.1 FDD  |  |
| Conf 2, 5, 8 | SR.1.1 TDD |  |
| Conf 3, 6, 9 | SR 2.1 TDD |  |
| RMSI CORESET reference measurement channel as defined in A.3.1.2 |  | Conf 1, 4, 7 | CR.1.1 FDD  | CR.1.1 FDD  |
| Conf 2, 5, 8 | CR.1.1 TDD |  |
| Conf 3, 6, 9 | CR.2.1 TDD |  |
| RMC CORESET reference measurement channel as defined in A.3.1.3 |  | Conf 1, 4, 7 | CCR.1.1 FDD  |  |
| Conf 2, 5, 8 | CCR.1.1 TDD |  |
| Conf 3, 6, 9 | CCR.2.1 TDD |  |
| OCNG Pattern Note 1 |  | Conf 1, 2, 4, 5, 7, 8 | OP.1 Note 4 |  |
|  |  | Conf 3, 6, 9 | OP.1 Note 5 |  |
| SSB configuration |  | Conf 1, 2, 4, 5, 7,8 | SSB.1 FR1  |  |
| Conf 3, 6, 9 | SSB.2 FR1  |  |
| SMTC configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | SMTC.1 |  |
| CSI-RS for tracking |  | Conf 1 | TRS.1.1 FDD |  |
|  |  | Conf 2 | TRS.1.1 FDD |  |
|  |  | Conf 3 | TRS.1.2 FDD |  |
|  |  | Conf 4 | TRS.1.1 TDD |  |
|  |  | Conf 5 | TRS.1.1 TDD |  |
|  |  | Conf 6 | TRS.1.2 TDD |  |
|  |  | Conf 7 | TRS.1.1 TDD |  |
|  |  | Conf 8 | TRS.1.1 TDD |  |
|  |  | Conf 9 | TRS.1.2 TDD |  |
| DL initial BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | DLBWP.0.1 |  |
| DL dedicated BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | DLBWP.1.1 |  |
| UL dedicated BWP configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | ULBWP.1.1 | ULBWP.1.1 |
| EPRE ratio of PSS to SSS | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 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 |
|  Note 2 | dBm / 15kHz | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | -102 |  |
| dBm/ SCS | Conf 1, 2, 4, 5, 7,8 | -102 |  |
| Conf 3, 6, 9 | -99 |  |
|  | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 16 | 16 | 16 |  |  |  |
|  Note 3 | dB | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 16 | 16 | 16 |  |  |  |
| SS-RSRP Note 3 | dBm/ SCS | Conf 1, 2, 4, 5, 7,8 | -86 | -86 | -86 |  |  |  |
| Conf 3, 6, 9 | -83 | -83 | -83 |  |  |  |
| Io Note 3 | dBm/ 9.36 MHz | Conf 1, 2, 4, 5, 7,8 | -57.9 | -57.9 | -57.9 |  |  |  |
| dBm/ 38.16MHz | Conf 3, 6, 9 | -51.8 | -51.8 | -51.8 |  |  |  |
| Propagation Condition  |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | AWGN |  |
| Antenna configuration |  | Conf 1, 2, 3, 4, 5, 6, 7, 8, 9 | 1 x 2 |  |
| SUL RSRP threshold (rsrp-ThresholdSSB-SUL) | dBm | Conf 1,2,3,4,5,6  | -75 |  |
|  |  | Conf 7,8,9 | -72 |  |
| 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 within BWoccupied.NOTE 3: , Io, and SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.NOTE 4: All UL/DL transmission shall be confined within BWoccupied (i.e. 10 MHz, 52 RBs) from FC,low, and Io is independent of the BWchannel configured.NOTE 5: All UL/DL transmission shall be confined within BWoccupied (i.e. 40 MHz, 106 RBs) from FC,low, and Io is independent of the BWchannel configured.NOTE 6: NRB,c. is derived from Table 5.3.2-1 in TS38.101-1[2] with configured BWchannel. |

##### A.6.5.4.1.2 Test Requirements

The UE shall be ready to start transmission on the supplementary uplink carrier on SCell within 20ms from the start of T2.

The UE shall stop the transmission on the supplementary uplink carrier on SCell within 20ms from the start of T3.

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

### <End of Change 2>