3GPP TSG-RAN WG4 Meeting #111 R4-240xxxx

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

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| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **-** | **rev** | **1** | **Current version:** | **18.5.0** |  |
|  |
| *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:***  | Correction on Subsequent Conditional PSCell addition/change (CPA/CPC) |
|  |  |
| ***Source to WG:*** | ZTE Corporation, Sanechips, Nokia |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_Mob\_enh2-Perf |  | ***Date:*** | 2024-05-23 |
|  |  |  |  |  |
| ***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 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:*** | For UE capable of both FR1-FR1 DC and FR1-FR2 DC, the UE only needs to pass one combination of CPA or CPC test cases. The test cases to pass are either 1) + 2) or 3) +4)1. Intra-frequency CPC from FR1-FR1 NR-DC to FR1-FR1 NR-DC
2. Inter-frequency CPA from FR1-FR1 NR-DC to FR1-FR1 NR-DC
3. Intra-frequency CPC from FR1-FR2 NR-DC to FR1-FR2 NR-DC
4. Inter-frequency CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC

Additional corrections:  A.6.5.X.2 Inter-frequency subsequent CPA: Fix event from A1 to A4A.7.5.X.2 Inter-frequency subsequent CPA: Fix event from A1 to A4Editorial changes  |
|  |  |
| ***Summary of change:*** | Align the descriptions of above four test cases, and UE only needs to pass either 1) + 2) or 3) + 4) A.6.5.X.2 Inter-frequency subsequent CPA: Fix event from A1 to A4 A.7.5.X.2 Inter-frequency subsequent CPA: Fix event from A1 to A4 |
|  |  |
| ***Consequences if not approved:*** | The descriptions of above four test cases are not aligned. |
|  |  |
| ***Clauses affected:*** | A.6.5.X.1, A.6.5.X.2, A.7.5.X.1, A.7.5.X.2 |
|  |  |
|  | **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.6.5.X.1 Intra-frequency subsequent CPC from FR1-FR1 NR-DC to FR1-FR1 NR-DC

##### A.6.5.X.1.1 Test purpose and environment

The purpose of this test is to verify that the subsequent conditional NR PSCell change under NR-DC is within the requirements stated in clause 8.11E.2.

For UE supporting subsequent conditional PSCell addition/change, UE only needs to pass either intra-frequency CPC from FR1-FR1 NR-DC to FR1-FR1 NR-DC defined in clause or intra-frequency CPC from FR1-FR2 NR-DC to FR1-FR2 NR-DC defined in clause A.7.5.X.1.

For UE which can pass this test, test of conditional PSCell addition and release delay defined in [A.6.5.10] can be skipped.

##### A.6.5.X.1.2 Test Parameters

Supported test configurations are shown in A.6.5.X.1.2-1. The test scenario comprises three NR cells, Cell 1, Cell 2, and Cell 3. Cell1 is on radio channel 1 in FR1. Cell 2 and 3 are on radio channel 2 in FR1. Test parameters are given in Tables A.6.5.X.1.2-2 and A.6.5.X.1.2-3 below.

The test consists of three successive time periods with duration of T1, T2, and T3 respectively. Before the test starts the UE is connected to Cell 1 (NR 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.

At the start of time duration T1, the UE does not have any timing information of Cell 2. The TE shall configure subsequent conditional PSCell addition/change with cell 2 and cell 3 as target PSCells during T1, at a time earlier than TRRC\_delay before the beginning of T2.

At the start of T2, cell 2 becomes detectable and meets the PSCell addition condition. UE shall be able to measure and detect that the condition is fulfilled, after which it will transmit the PRACH preamble to cell 2. Upon PSCell addition complete (UE transmits SN RRCReconfigurationComplete message), T3 starts.

At the start of T3, cell 3 becomes detectable and meets the PSCell change condition. UE shall be able to measure and detect that the condition is fulfilled, after which it will transmit the PRACH preamble to cell 3.

Table A.6.5.X.1.2-1: Supported test configurations for Intra-frequency CPC from FR1-FR1 NR-DC to FR1-FR1 NR-DC

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

Table A.6.5.X.1.2-2: General Test Parameters for Intra-frequency CPC from FR1-FR1 NR-DC to FR1-FR1 NR-DC

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| RF Channel Number |  | 1, 2 | Two radio channels are used for this test. One for PCell and second for NR PSCell |
| Initial  | Active PCell |  | Cell1 | PCell on RF channel number 1. |
|  | Neighbour cell |  | Cell2, Cell3 | Neighbour cells on RF channel number 2. |
| Final  | Active PCell |  | Cell1 | PCell on RF channel number 1. |
| Condition | active PSCell |  | Cell3 | PSCell on RF channel number 2. |
| A4 | Hysteresis | dB | 0 | Used to trigger conditional PSCell addition of Cell 2  |
|  | Threshold RSRP | dBm | -118 |
|  | Time to Trigger | S | 0 |
| A3 | dB | 0 | Used to trigger conditional PSCell change from Cell 2 to Cell 3 |
| DRX |  | OFF | Continuous monitoring of primary cell |
| Measurement gap pattern Id |  | 0 | Gaps are configured during T1, T2 and released upon T3 starts. |
| PRACH configuration on cell2 and cell3 |  | FR1 PRACH configuration 1 | Captured in A.3.8.2.1 |
| 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 is known and Cell 2 is unknown. |
| T2 | s | ≤5 | During this time Cell 2 meets the PSCell addition condition and UE adds this PSCell. |
| T3 | s | ≤5 | During this time Cell 3 meets the PSCell change condition and UE sends PRACH to Cell 3. |

Table A.6.5.X.1.2-3: Cell Specific Parameters for Intra-frequency CPC from FR1-FR1 NR-DC to FR1-FR1 NR-DC

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Config | Cell 2 | Cell 3 |
|  |  |  | T1 | T2 | T3 | T1 | T2 | T3 |
| NR RF Channel Number |  | 1,2,3,4,5,6 | 1 | 1 |
| NR RF Channel Number |  | 1,2,3,4,5,6 | 1 | 1 |
| TDD  |  | 1,4 | Not Applicable | Not Applicable |
| configuration |  | 2,5 | TDDConf.1.1 | TDDConf.1.1 |
|  |  | 3,6 | TDDConf.2.1 | TDDConf.2.1 |
| BWchannel | MHz | 1,4 | 10: NRB,c = 52 | 10: NRB,c = 52 |
|  |  | 2,5 | 10: NRB,c = 52 | 10: NRB,c = 52 |
|  |  | 3,6 | 40: NRB,c = 106 | 40: NRB,c = 106 |
| Initial BWP Configuration |  | 1,2,3 | DLBWP.0.1ULBWP.0.1 | DLBWP.0.1ULBWP.0.1 |
| Dedicated BWP Configuration |  | 1,2,3 | DLBWP.1.1ULBWP.1.1 | DLBWP.1.1ULBWP.1.1 |
| PDSCH Reference  |  | 1,4 | SR.1.1 FDD | SR.1.1 FDD |
| measurement |  | 2,5 | SR.1.1 TDD | SR.1.1 TDD |
| channel |  | 3,6 | SR.2.1 TDD | SR.2.1 TDD |
| RMSI CORESET Reference  |  | 1,4 | CR.1.1 FDD | CR.1.1 FDD |
| Channel |  | 2,5 | CR.1.1 TDD | CR.1.1 TDD |
|  |  | 3,6 | CR.2.1 TDD | CR.2.1 TDD |
| Dedicated CORESET Reference  |  | 1,4 | CCR.1.1 FDD | CCR.1.1 FDD |
| Channel |  | 2,5 | CCR.1.1 TDD | CCR.1.1 TDD |
|  |  | 3,6 | CCR.2.1 TDD | CCR.2.1 TDD |
| OCNG Patterns |  | 1,2,3,4,5,6 | OP.1 | OP.1 |
| SSB configuration |  | 1,2,4,5 | SSB.1 FR1 | SSB.1 FR1 |
|  |  | 3,6 | SSB.2 FR1 | SSB.2 FR1 |
| SMTC configuration |  | 1,2,4,5 | SMTC.1 | SMTC.1 |
|  |  | 3,6 | SMTC.1 | SMTC.1 |
| TRS Configuration |  | 1,4 | TRS.1.1 FDD | TRS.1.1 FDD |
|  |  | 2,5 | TRS.1.1 TDD | TRS.1.1 TDD |
|  |  | 3,6 | TRS.1.2 TDD | TRS.1.2 TDD |
| CSI-RS configuration for CSI reporting  |  | 1,4 | CSI-RS.1.1 FDD | CSI-RS.1.1 FDD |
| 2,5 | CSI-RS.1.1 TDD | CSI-RS.1.1 TDD |
| 3,6 | CSI-RS.2.1 TDD | CSI-RS.2.1 TDD |
| reportConfigType |  | 1,2,3,4,5,6 | periodic | periodic |
| reportQuantity |  | 1,2,3,4,5,6 | cri-RI-PMI-CQI | cri-RI-PMI-CQI |
| CSI reporting periodicity | slot | 1,2,4,5 | 5 | 5 |
| 3,6 | 10 | 10 |
| CSI reporting offset | slot | 1,2,4,5 | 2 | 2 |
| 3,6 | 4 | 4 |
| 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 | 1,2,3,4,5,6 | 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/15 kHz | 1,2,3,4,5,6 | -98 |
| Note2 | dBm/SCS | 1,2,4,5 | -98 |
|  |  | 3,6 | -95 |
|  |  | 1,2,3,4,5,6 | -infinity | 8 | -3.3 | -infinity | -infinity | 2.36 |
|  |  | 1,2,3,4,5,6 | -infinity | 8 | 8 | -infinity | -infinity | 11 |
| SS-RSRPNote3 | dBm/SCS | 1,2,4,5 | -infinity | -90 | -90 | -infinity | -infinity | -87 |
|  |  | 3,6 | -infinity | -87 | -87 | -infinity | -infinity | -84 |
| IoNote3 | dBm/9.36MHz | 1,2,4,5 | -70.05 | -61.41 | -57.06 | -70.05 | -61.41 | -57.06 |
|  | dBm/38.1MHz | 3,6 | -63.94 | -55.31 | -50.96 | -63.94 | -55.31 | -50.96 |
| Propagation condition |  | 1,2,3,4,5,6 | 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.6.5.X.1.3 Test Requirements

TRRC\_delay + TEvent\_DU for PSCell addition (Cell 2) occurs during T1 as the addition condition becomes satisfied at the start of T2. The test shall verify that there are no interruptions during T1.

The UE shall start to transmit the PRACH to Cell 2 less than Tmeasure + TUE\_preparation + Tprocessing + T∆ + TPSCell\_ DU + 2 ms = 920+10+62ms=992 ms from the start of T2.

The UE shall start to transmit the PRACH to Cell 3 less than TEvent\_DU + Tmeasure + TUE\_preparation + Tprocessing + T∆ + TPSCell\_ DU + 2 ms = 0+920+10+62ms=992 ms from the start of T3.

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

<End of Change 1>

<Start of Change 2>

#### A.6.5.X.2 Inter-frequency subsequent CPA from FR1-FR1 NR-DC to FR1-FR1 NR-DC

##### A.6.5.X.2.1 Test purpose and environment

The purpose of this test is to verify that the subsequent conditional NR PSCell addition under NR-DC is within the requirements stated in clause 8.9C.2.

For UE supporting subsequent conditional PSCell addition/change, UE only needs to pass either inter-frequency CPA from FR1-FR1 NR-DC to FR1-FR1 NR-DC defined in clause or inter-frequency CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC defined in clause A.7.5.X.2.

For UE which can pass this test, test of conditional PSCell addition and release delay defined in [A.6.5.10] can be skipped.

##### A.6.5.X.2.2 Test Parameters

Supported test configurations are shown in A.6.5.X.2.2-1.

The test parameters for NR Cell 2 and Cell 3 are given in Tables A.6.5.X.2.2-2 and cell-specific parameters in A.6.5.X.2.2-3 below.

The test consists of four successive time periods with duration of T1, T2, T3 and T4 respectively. Before the test starts the UE is connected to Cell 1 (NR 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.

At the start of time duration T1, the UE does not have any timing information of Cell 2. The TE shall configure subsequent conditional PSCell addition with cell 2 and cell 3 as target PSCells during T1, at a time earlier than TRRC\_delay before the beginning of T2.

At the start of T2, cell 2 becomes detectable and meets the PSCell addition condition. UE shall be able to measure and detect that the condition is fulfilled, after which it will transmit the PRACH preamble to cell 2. Upon PSCell addition complete (UE transmits SN RRCReconfigurationComplete message), T3 starts.

At the start of T3, the test system shall send a RRCReconfiguration message to the UE to release PSCell (Cell 2) on radio channel 2. Upon PSCell release complete (UE transmits SN RRCReconfigurationComplete message), T4 starts.

At the start of T4, cell 3 becomes detectable and meets the subsequent PSCell addition condition. UE shall be able to measure and detect that the condition is fulfilled during time Tmeasure, after which it will transmit the PRACH preamble to cell 3.

Table A.6.5.X.2.2-1: Supported test configurations for Inter-frequency Subsequent CPA from FR1-FR1 NR-DC to FR1-FR1 NR-DC

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | PCell: 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode. PSCell: FDD |
| 2 | PCell: 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode. PSCell: FDD |
| 3 | PCell: 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode. PSCell: FDD |
| 4 | PCell: 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode. PSCell: TDD |
| 5 | PCell: 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode. PSCell: TDD |
| 6 | PCell: 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode. PSCell: TDD |
| Note: The UE is only required to pass in one of the supported test configurations in FR1 |

Table A.6.5.X.2.2-2: General Test Parameters for Inter-frequency Subsequent CPA from FR1-FR1 NR-DC to FR1-FR1 NR-DC

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| RF Channel Number |  | 1, 2, 3 | Three radio channels are used for NR Cells for this test.  |
| Initial  | Active PCell |  | Cell1 | PCell on RF channel number 1. |
|  | Neighbour cell |  | Cell2 | Neighbour cell on RF channel number 2. |
|  |  | Cell3 | Neighbour cell on RF channel number 3. |
| Final  | Active PCell |  | Cell1 | PCell on RF channel number 1. |
| Condition | Active PSCell |  | Cell3 | PSCell on RF channel number 3 |
|  | Neighbour Cell |  | Cell2 | Neighbour cell on RF channel number 2 |
| A4 | Hysteresis | dB | 0 | A4 event is used to trigger conditional PSCell addition of Cell 2 |
|  | Threshold RSRP | dBm | -118 |  |
|  | Time to Trigger | s | 0 |  |
| DRX |  | OFF | Continuous monitoring of primary cell |
| Measurement gap pattern Id |  | 0 | Gaps are configured during T1, T2, T3 and T4. |
| PRACH configuration on cell2 |  | FR1 PRACH configuration 1 | Captured in A.3.8.2.1 |
| 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.  |
| Cell-individual offset for cells on RF channel number 3 | dB | 0 | Individual offset for cells on carrier frequency of cell3.  |
| T1 | s | 1 | During this time the PCell is known, PSCell 1 and PSCell 2 are unknown. |
| T2 | s | ≤7 | During this time PSCell 1 meets the PSCell addition condition and UE adds this PSCell. |
| T3 | s | ≤1 | During this time the UE releases the PSCell 1. |
| T4 | s | ≤7 | During this time PSCell 2 meets the addition condition and UE adds this PSCell. |

Table A.6.5.X.2.2-3: Cell Specific Parameters for Intra-frequency CPA from FR1-FR1 NR-DC to FR1-FR1 NR-DC

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Config | Cell 2 | Cell 3 |
|  |  |  | T1 | T2 | T3 | T4 | T1 | T2 | T3 | T4 |
| NR RF Channel Number |  | 1,2,3,4,5,6 | 2 | 3 |
| TDD  |  | 1,4 | Not Applicable | Not Applicable |
| configuration |  | 2,5 | TDDConf.1.1 | TDDConf.1.1 |
|  |  | 3,6 | TDDConf.2.1 | TDDConf.2.1 |
| BWchannel | MHz | 1,4 | 10: NRB,c = 52 | 10: NRB,c = 52 |
|  |  | 2,5 | 10: NRB,c = 52 | 10: NRB,c = 52 |
|  |  | 3,6 | 40: NRB,c = 106 | 40: NRB,c = 106 |
| Initial BWP Configuration |  | 1,2,3 | DLBWP.0.1ULBWP.0.1 | DLBWP.0.1ULBWP.0.1 |
| Dedicated BWP Configuration |  | 1,2,3 | DLBWP.1.1ULBWP.1.1 | DLBWP.1.1ULBWP.1.1 |
| PDSCH Reference  |  | 1,4 | SR.1.1 FDD | SR.1.1 FDD |
| measurement |  | 2,5 | SR.1.1 TDD | SR.1.1 TDD |
| channel |  | 3,6 | SR.2.1 TDD | SR.2.1 TDD |
| RMSI CORESET Reference  |  | 1,4 | CR.1.1 FDD | CR.1.1 FDD |
| Channel |  | 2,5 | CR.1.1 TDD | CR.1.1 TDD |
|  |  | 3,6 | CR.2.1 TDD | CR.2.1 TDD |
| Dedicated CORESET Reference  |  | 1,4 | CCR.1.1 FDD | CCR.1.1 FDD |
| Channel |  | 2,5 | CCR.1.1 TDD | CCR.1.1 TDD |
|  |  | 3,6 | CCR.2.1 TDD | CCR.2.1 TDD |
| OCNG Patterns |  | 1,2,3,4,5,6 | OP.1 | OP.1 |
| SSB configuration |  | 1,2,4,5 | SSB.1 FR1 | SSB.1 FR1 |
|  |  | 3,6 | SSB.2 FR1 | SSB.2 FR1 |
| SMTC configuration |  | 1,2,4,5 | SMTC.1 | SMTC.1 |
|  |  | 3,6 | SMTC.1 | SMTC.1 |
| TRS Configuration |  | 1,4 | TRS.1.1 FDD | TRS.1.1 FDD |
|  |  | 2,5 | TRS.1.1 TDD | TRS.1.1 TDD |
|  |  | 3,6 | TRS.1.2 TDD | TRS.1.2 TDD |
| CSI-RS configuration for CSI reporting  |  | 1,4 | CSI-RS.1.1 FDD | CSI-RS.1.1 FDD |
| 2,5 | CSI-RS.1.1 TDD | CSI-RS.1.1 TDD |
| 3,6 | CSI-RS.2.1 TDD | CSI-RS.2.1 TDD |
| reportConfigType |  | 1,2,3,4,5,6 | periodic | periodic |
| reportQuantity |  | 1,2,3,4,5,6 | cri-RI-PMI-CQI | cri-RI-PMI-CQI |
| CSI reporting periodicity | slot | 1,2,4,5 | 5 | 5 |
| 3,6 | 10 | 10 |
| CSI reporting offset | slot | 1,2,4,5 | 2 | 2 |
| 3,6 | 4 | 4 |
| 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 | 1,2,3,4,5,6 | 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/15 kHz | 1,2,3,4,5,6 | -85 |
| Note2 | dBm/SCS | 1,2,4,5 | -85 |
|  |  | 3,6 | -82 |
|  |  | 1,2,3,4,5,6 | -∞ | 0 | -∞ | -∞ | -∞ | -∞ | -∞ | 0 |
|  |  | 1,2,3,4,5,6 | -∞ | 0 | -∞ | -∞ | -∞ | -∞ | -∞ | 0 |
| SS-RSRPNote3 | dBm/SCS | 1,2,4,5 | -∞ | -85 | -∞ | -∞ | -∞ | -∞ | -∞ | -85 |
|  |  | 3,6 | -∞ | -82 | -∞ | -∞ | -∞ | -∞ | -∞ | -82 |
| IoNote3 | dBm/9.36MHz | 1,2,4,5 | -57 | -54 | -57 | -57 | -57 | -57 | -57 | -54 |
|  | dBm/38.1MHz | 3,6 | -57 | -48 | -57 | -57 | -57 | -57 | -57 | -48 |
| Propagation condition |  | 1,2,3,4,5,6 | 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.6.5.X.2.3 Test Requirements

TRRC\_delay + TEvent\_DU for PSCell addition (Cell 2) occurs during T1 as the addition condition becomes satisfied at the start of T2. The test shall verify that there are no interruptions during T1.

The UE shall start to transmit the PRACH to Cell 2 less than Tmeasure + TUE\_preparation + Tprocessing + T∆ + TPSCell\_ DU + 2 ms = 1040+10+62ms=1112 ms from the start of T2.

The UE shall start to transmit the PRACH to Cell 3 less than TEvent\_DU + Tmeasure + TUE\_preparation + Tprocessing + T∆ + TPSCell\_ DU + 2 ms = 0+1040+10+62ms=1112 ms from the start of T4.

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

<End of Change 2>

<Start of Change 3>

#### A.7.5.X.1 Intra-frequency subsequent CPC from FR1-FR2 NR-DC to FR1-FR2 NR-DC

##### A.7.5.X.1.1 Test purpose and environment

The purpose of this test is to verify that the subsequent conditional NR PSCell change under NR-DC is within the requirements stated in clause 8.11E.2.

For UE supporting subsequent conditional PSCell addition/change, UE only needs to pass either intra-frequency CPC from FR1-FR1 NR-DC to FR1-FR1 NR-DC defined in clause or intra-frequency CPC from FR1-FR2 NR-DC to FR1-FR2 NR-DC defined in clause A.6.5.X.1.

For UE which can pass this test, test of conditional PSCell addition and release delay defined in [A.7.5.12] can be skipped.

 Supported test configurations are shown in A.7.5.X.1.1-1. The test scenario comprises three NR cells, Cell 1, Cell 2 and Cell 3. Cell1 is on radio channel 1 in FR1. Cell 2 and Cell 3 are on radio channel 2 in FR2. The test parameters for the NR Cell1 are given in Table A.3.7A. The NR Cell 1 once set up is not changed across time. The test parameters for NR Cell 2 and Cell 3 are given in Tables A.7.5.X.1.1-2, cell-specific parameters in A.7.5.X.1.1-3 and OTA parameters in A.7.5.X.1.1-4 below.

The test consists of three successive time periods with duration of T1, T2, and T3 respectively. There are two carriers each with one cell. Before the test starts the UE is connected to Cell 1 (NR PCell) on radio channel 1 (PCC) but is not aware of Cell 2 (NR PSCell 1) and Cell 3 (NR PSCell 2) on radio channel 2. The UE is only monitoring the PCC. During T1 only Cell 1 is known to the UE.

At the start of time duration T1, the UE does not have any timing information of Cell 2. The TE shall configure subsequent conditional PSCell addition/change with Cell 2 and Cell 3 as target PSCells during T1, at a time earlier than TRRC\_delay before the beginning of T2.

At the start of T2, Cell 2 becomes detectable and meets the PSCell addition condition. UE shall be able to measure and detect that the condition is fulfilled, after which it will transmit the PRACH preamble to Cell 2 during T2.

Upon PSCell addition complete (UE transmits SN RRCReconfigurationcomplete message), T3 starts. At the start of T3, Cell 3 becomes detectable and meets the PSCell change condition. UE shall be able to measure and detect that the condition is fulfilled, after which it will transmit the PRACH preamble to Cell 3 during T3.

Table A.7.5.X.1.1-1: Supported test configurations forIntra-frequency CPC from FR1-FR2 NR-DC to FR1-FR2 NR-DC

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | PCell (Cell 1): NR FDD, 15 kHz SSB SCS, 10 MHz bandwidthPSCell (Cell 2 and Cell 3):NR TDD, SSB SCS 240 kHz, data SCS 120 kHz, BW 100 MHz bandwidth |
| 2 | PCell (Cell 1): NR TDD, 15 kHz SSB SCS, 10 MHz bandwidthPSCell (Cell 2 and Cell 3):NR TDD, SSB SCS 240 kHz, data SCS 120 kHz, BW 100 MHz bandwidth |
| 3 | PCell (Cell 1): NR TDD, 30 kHz SSB SCS, 40 MHz bandwidthPSCell (Cell 2 and Cell 3):NR TDD, SSB SCS 240 kHz, data SCS 120 kHz, BW 100 MHz bandwidth |
| Note: The UE is only required to be tested in one of the supported test configurations |

Table A.7.5.X.1.1-2: General Test Parameters for Intra-frequency CPC from FR1-FR2 NR-DC to FR1-FR2 NR-DC

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1, 2 | Three radio channels are used for this test. One for NR Cell1, second for NR Cell2 and Cell3 |
| Initial  | Active PCell |  | Cell1,Cell2 | Cell1: NR PCell on RF channel number 1.Cell2: NR PSCell on RF channel number 2 |
| Condition | Neighbour cell |  | Cell3 | Neighbour cell on RF channel number 2. |
| Final  | Active PCell |  | Cell1,Cell3 | Cell1: PCell on RF channel number 1.Cell3:NR PSCell on RF channel number 2 |
| Condition | Neighbour Cell |  | Cell2 | PSCell changed on RF channel number 2. |
| A4 | Hysteresis | dB | 0 | Used to trigger conditional PSCell addition of Cell 2 |
|  | Threshold RSRP | dBm | -118 |
|  | Time to Trigger | s | 0 |
| A3 | dB | 0 | Used to trigger conditional PSCell change from Cell 2 to Cell 3 |
| DRX |  | OFF | Continuous monitoring of primary cell |
| Gap pattern ID |  | gp0 | Gaps are configured during T1, T2 and released upon T3 starts. |
| PRACH configuration on cell2 |  | FR2 configuration 2 | Captured in A.3.8.3.2 |
| 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. |
| Cell-individual offset for cells on RF channel number 3 | dB | 0 | Individual offset for cells on carrier frequency of cell3. |
| T1 | s | 1 | During this time the PCell is known and Cell 2 is unknown. |
| T2 | s | ≤5 | During this time Cell 2 meets the PSCell addition condition and UE adds this PSCell. |
| T3 | s | ≤5 | During this time Cell 3 meets the PSCell change condition and UE sends PRACH to Cell 3. |

Table A.7.5.X.1.1-3: Cell Specific Parameters for Intra-frequency CPC from FR1-FR2 NR-DC to FR1-FR2 NR-DC

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Config** | **Test** |
|  |  |  | **T1** | **T2** | **T3** |
| NR Channel Number |  | 1,2,3 | 1 for Cell 1 |
| NR Channel Number |  | 1,2,3 | 2 for Cell 2 and Cell 3 |
| Duplex Mode |  | 1,2,3 | TDD |
| TDD configuration |  | 1,2,3 | TDDConf.3.1 |
| BWchannel | MHz | 1,2,3 | 100: NRB,c = 66 |
| Data RBs allocated |  | 1,2,3 | 48 |
| Initial BWP Configuration |  | 1,2,3 | DLBWP.0.1ULBWP.0.1 |
| Dedicated BWP Configuration |  | 1,2,3 | DLBWP.1.1ULBWP.1.1 |
| TRS Configuration |  | 1,2,3 | TRS.2.1 TDD |
| PDSCH/PDCCH TCI state |  | 1,2,3 | TCI.State.2 |
| PDSCH Reference measurement channel |  | 1,2,3 | SR.3.3 TDD |
| RMSI CORESET Reference Channel |  | 1,2,3 | CR.3.2 TDD |
| Dedicated CORESET Reference Channel |  | 1,2,3 | CCR.3.7 TDD |
| OCNG Patterns |  | 1,2,3 | OP.3 |
| SSB configuration |  | 1,2,3 | SSB.2 FR2 |
| SMTC configuration |  | 1,2,3 | SMTC.2 |
| PDSCH/PDCCH subcarrier spacing | kHz | 1,2,3 | 120 |
| TRS Configuration |  | 1,2,3 | TRS.2.1 TDD |
| CSI-RS configuration for CSI reporting |  | 1,2,3 | CSI-RS.3.1 TDD |
| reportConfigType |  | 1,2,3 | periodic |
| reportQuantity |  | 1,2,3 | cri-RI-PMI-CQI |
| CSI reporting periodicity | slot | 1,2,3 | 40 |
| CSI reporting offset | slot | 1,2,3 | 4 |
| EPRE ratio of PSS to SSS | dB | 1,2,3 | 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) |  |  |  |
| Propagation condition |  | 1,2,3 | AWGN |

Table A.7.5.X.1.1-4: OTA related test parameters for Intra-frequency CPC from FR1-FR2 NR-DC to FR1-FR2 NR-DC

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 2** | **Cell 3** |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| Angle of arrival configuration |  | Setup 2a according to clause A.3.15.2.1 | Setup 2a according to clause A.3.15.2.1 |
| Assumption for UE beamsNote 6 |  | Rough | Rough |
| Ês Note2 | dBm/SCS | -∞ | -81 | -81 | -∞ | -∞ | -78 |
| SSB\_RPNote2, Note 4 | dBm/SCS | -∞ | -81 | -81 | -∞ | -∞ | -78 |
|  BB Note 2, Note 7 | dB | -∞ | 4.88 | 4.88 | -∞ | -∞ | 4.88 |
| IoNote 2, Note 4 | dBm/95.04 MHz | N/A | -56.41 | -56.41 | N/A | N/A | -56.41 |
| Note 1: VoidNote 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: VoidNote 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zoneNote 5: VoidNote 6: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementationNote 7: 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.7.5.X.1.2 Test Requirements

TRRC\_delay +TEvent\_DU for PSCell addition (Cell 2) occurs during T1 as the PSCell addition condition becomes satisfied at the start of T2. The test shall verify that there are no interruptions during T1.

The UE shall start to transmit the PRACH to Cell 2 less than Tmeasure + TUE\_preparation + Tprocessing + T∆ + TPSCell\_ DU + 2 ms from the start of T2.

The UE shall transmit the PRACH to Cell 3 less than Tconfig\_PSCell\_Subsequent\_Change\_Conditional Note1 from the start of T3.

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

Note1: The subsequent Conditional PSCell change delay during T3 can be expressed as follows:

Tconfig\_PSCell\_Subsequent\_Change\_Conditional = TEvent\_DU +Tmeasure + TUE\_preparation + Tprocessing + T∆ + TPSCell\_ DU + 2 ms

Where:

TEvent\_DU  = 0ms

Tmeasure = 6720ms for power class 1 or 4160 for power class 2/3/4

TUE\_preparation = 10ms

Tprocessing = 40ms

T∆ = 20ms

TPSCell\_ DU = 1\*10+10 = 20 ms

<End of Change 3>

<Start of Change 4>

#### A.7.5.X.2 Inter-frequency subsequent CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC

##### A.7.5.X.2.1 Test Purpose and Environment

The purpose of this test is to verify that the sunsequent conditional NR PSCell addition under NR-DC is within the requirements stated in clause 8.9C.2.

For UE supporting subsequent conditional PSCell addition/change, UE only needs to pass either inter-frequency CPA from FR1-FR1 NR-DC to FR1-FR1 NR-DC defined in clause or inter-frequency CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC defined in clause A.6.5.X.2.

For UE which can pass this test, test of conditional PSCell addition and release delay defined in [A.7.5.12] can be skipped.

Supported test configurations are shown in A.7.5.X.2.1-1. The test parameters for the NR cell 1 are given in Table A.3.7A. The NR cell 1 once set up is not changed across time.

The test parameters for NR cell 2, NR cell 3 are given in Tables A.7.5.X.2.1-2, cell-specific parameters in A.7.5.X.2.1-3 and OTA parameters in A.7.5.X.2.1-4 below. The test comprises of three NR carrier. There are three cells and one cell on each carrier. Before the test starts the UE is connected to Cell 1 (NR PCell) on radio channel 1, but is not aware of Cell 2 (NR candidate NR PSCell 1) on radio channel 2 and Cell 3 (NR candidate PSCell 2) on radio channel 3. The test consists of four successive time periods with duration of T1, T2, T3, T4.

During T1, the UE does not have any timing information of Cell 2 and Cell 3. The TE shall configure subsequent conditional PSCell addition/change with Cell 2 and Cell 3 as target PSCells during T1, at a time earlier than TRRC\_delay before the beginning of T2.

At the start of T2, Cell 2 becomes detectable and meets the PSCell addition condition. UE shall be able to measure and detect that the condition is fulfilled, after which the UE shall transmit the PRACH preamble to Cell 2. Upon PSCell addition complete (UE transmits SN RRCReconfigurationcomplete message), T3 starts.

During T3, the TE shall send a RRCReconfiguration message to the UE to release PSCell (Cell 2) on radio channel 2. Upon PSCell release complete (UE transmits SN RRCReconfigurationcomplete message), T4 starts.

At the start of T4, Cell 3 becomes detectable and meets the addition condition. UE shall be able to measure and detect that the condition is fulfilled, after which UE shall send PRACH to the PSCell (Cell 3).

Table A.7.5.X.2.1-1: Supported test configurations for Inter-frequency Subsequent CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | Cell 1: FDD15 kHz SSB SCS, 10 MHz bandwidth, Cell 2: TDD 120kHz SSB SCS, 100MHz bandwidthCell 3: TDD 120kHz SSB SCS, 100MHz bandwidth |
| 2 | Cell 1: TDD 15 kHz SSB SCS, 10 MHz bandwidth,Cell 2: TDD 120kHz SSB SCS, 100MHz bandwidthCell 3: TDD 120kHz SSB SCS, 100MHz bandwidth |
| 3 | Cell 1: TDD 30 kHz SSB SCS, 40 MHz bandwidth,Cell 2: TDD 120kHz SSB SCS, 100MHz bandwidthCell 3: TDD 120kHz SSB SCS, 100MHz bandwidth |
| Note: The UE is only required to be tested in one of the supported test configurations |

Table A.7.5.X.2.1-2: General Test Parameters Inter-frequency Subsequent CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1, 2, 3 | Three NR radio channels are used for this test.  |
| Initial | Active serving cells |  | Cell1,  | Cell1: NR PCell on RF channel number 1 |
| Condition | Neighbour cell |  | Cell2, Cell3 | Cell2:NR PSCell on RF channel number 2Neighbour cell on RF channel number 3 |
| Final  | Active serving cells |  | Cell1, Cell3 | Cell1: PCell on RF channel number 1Cell3:NR PSCell on RF channel number 3 |
| Condition | Neighbour Cell |  | Cell2 | Neighbour cell on RF channel number 2. |
| A4 | Hysteresis | dB | 0 | A4 event is used to trigger conditional PSCell addition of Cell 2 |
|  | Threshold RSRP | dBm | -118 |  |
|  | Time to Trigger | s | 0 |  |
| DRX |  | OFF | Continuous monitoring of primary cell |
| Gap pattern ID |  | gp0 |  |
| PRACH configuration on cell3 |  | FR2 configuration 2 | Captured in A.3.8.3.2 |
| 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. |
| Cell-individual offset for cells on RF channel number 3 | dB | 0 | Individual offset for cells on carrier frequency of cell3. |
| T1 | s | 1 | UE is connected to Cell 1 (NR PCell) on radio channel 1, but is not aware of Cell 2 (NR PSCell 1) on radio channel 2 and Cell (NR PSCell 2) on radio channel 3 |
| T2 |  | <7 | During this time PSCell 1 meets the PSCell addition condition and the UE adds the PSCell (cell 2). |
| T3 | s | 1 | During this time the UE releases the PSCell (cell 2). |
| T4 | s | <7 | During this time PSCell 2 meets the PSCell addition condition and the UE adds the PSCell (cell 3). |

Table A.7.5.X.2.1-3: Cell Specific Parameters for Intra-frequency CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Config** | **Test** |
|  |  |  | **T1** | **T2** | **T3** | **T4** |
| NR Channel Number |  | 1,2,3 | 2 for cell 2, 3 for cell 3 |
| Duplex Mode |  | 1,2,3 | TDD |
| TDD configuration |  | 1,2,3 | TDDConf.3.1 |
| BWchannel | MHz | 1,2,3 | 100: NRB,c = 66 |
| Data RBs allocated |  | 1,2,3 | 48 |
| Initial BWP Configuration |  | 1,2,3 | DLBWP.0.1ULBWP.0.1 |
| Dedicated BWP Configuration |  | 1,2,3 | DLBWP.1.1ULBWP.1.1 |
| TRS Configuration |  | 1,2,3 | TRS.2.1 TDD |
| PDSCH/PDCCH TCI state |  | 1,2,3 | TCI.State.2 |
| PDSCH Reference measurement channel |  | 1,2,3 | SR.3.3 TDD |
| RMSI CORESET Reference Channel |  | 1,2,3 | CR.3.2 TDD |
| Dedicated CORESET Reference Channel |  | 1,2,3 | CCR.3.7 TDD |
| OCNG Patterns |  | 1,2,3 | OP.3 |
| SSB configuration |  | 1,2,3 | SSB.2 FR2 |
| SMTC configuration |  | 1,2,3 | SMTC.2 |
| PDSCH/PDCCH subcarrier spacing | kHz | 1,2,3 | 120 |
| TRS Configuration |  | 1,2,3 | TRS.2.1 TDD |
| CSI-RS configuration for CSI reporting |  | 1,2,3 | CSI-RS.3.1 TDD |
| reportConfigType |  | 1,2,3 | periodic |
| reportQuantity |  | 1,2,3 | cri-RI-PMI-CQI |
| CSI reporting periodicity | slot | 1,2,3 | 40 |
| CSI reporting offset | slot | 1,2,3 | 4 |
| EPRE ratio of PSS to SSS | dB | 1,2,3 | 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) |  |  |  |
| Propagation condition |  | 1,2,3 | AWGN |

Table A.7.5.X.2.1-4: OTA related test parameters for Intra-frequency CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 2** | **Cell 3** |
| **T1** | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** |
| Angle of arrival configuration |  | Setup 2a according to clause A.3.15.2.1 | Setup 2a according to clause A.3.15.2.1 |
| Assumption for UE beamsNote 6 |  | Rough | Rough |
| Ês Note2 | dBm/SCS | -∞ | -81 | -∞ | -∞ | -81 |
| SSB\_RPNote2, Note 4 | dBm/SCS | -∞ | -81 | -∞ | -∞ | -81 |
|  BB Note 2, Note 7 | dB | -∞ | 4.88 | -∞ | -∞ | 4.88 |
| IoNote 2, Note 4 | dBm/95.04 MHz | N/A | -56.41 | N/A | N/A | -56.41 |
| Note 1: VoidNote 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: VoidNote 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zoneNote 5: VoidNote 6: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementationNote 7: 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.7.5.X.2.2 Test Requirements

TRRC\_delay + TEvent\_DU for PSCell addition (Cell 2) occurs during T1 as the PSCell addition condition becomes satisfied at the start of T2. The test shall verify that there are no interruptions during T1.

The UE shall transmit the PRACH to PSCell (Cell 2) less than Tconfig\_PSCell\_Addition\_Conditional Note1 from the start of T2.

The UE shall transmit the PRACH to PSCell (Cell 3) less than Tconfig\_PSCell\_Addition\_Conditional Note1 from the start of T4.

All the above test requirements shall be fulfilled 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%.

Note 1: The PSCell addition delay during T2 can be expressed as follows:

 Tconfig\_PSCell\_Addition\_Conditional = Tmeasure + TUE\_preparation + Tprocessing + T∆ + TPSCell\_ DU + 2 ms

Where:

Tmeasure = 6720ms for power class 1 or 4160 for power class 2/3/4

TUE\_preparation = 10ms

Tprocessing = 40ms

T∆ = 20ms

TPSCell\_ DU = 1\*10+10 = 20 ms

<End of Change 4>