**3GPP TSG-RAN4 Meeting #94bis-e *R4-2007673***

**Online, 20th April – 1st May 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **0757** | **rev** | **-** | **Current version:** | **15.9.0** |  |
|  | | | | | | | | |
| *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:*** | CR to FR1 SCell activation delay test cases | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Perf | | | | |  | ***Date:*** | | | 2020-05-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-15 |
|  | *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 e?planations 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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. In recent RAN4 meeting cycles many agreements on SCell activation/deactivation delay have been reached. So SCell activation/deactivation delay TCs shall be updated accordingly. 2. Some test requirements and parameters are still in brackets. 3. Value and unit of THARQ given in test parameters of EN-DC SCell activation delay TCs are wrong. it shall be “k1\*NR slot length (ms)” rather than “k slots”. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. SCell activation/deactivation delay TCs are updated to capture the progress in Core part. 2. Brackets on test requirements and parameters are removed. 3. Value and unit of THARQ is changed to k1\*NR slot length (ms). 4. Typos are corrected. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | TCs are incorrect. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.4.5.3, A.6.5.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS/TR 38.133 CR 0745 | | |
| ***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 modified section 1>**

A.4.5.3 SCell Activation and Deactivation Delay

#### A.4.5.3.1 SCell Activation and deactivation of known SCell in FR1 for 160ms SCell measurement cycle

##### A.4.5.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in clause 8.3, when the SCell in FR1 is known by the UE at the time of activation.

The supported test configurations are shown in table A.4.5.3.1.1-1 below. The test parameters are given in Tables A.4.5.3.1.1-2 and cell-specific parameters in A.4.5.3.1.1-3 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, E-UTRA has one cell, NR has two cells. All cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on E-UTRA and Cell 2 (PSCell) on NR, but is not aware of Cell 3 (SCell) on NR. The UE is monitoring the PCell and PSCell. The UE shall be continuously scheduled in the PCell and PSCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (Cell 3) becomes configured on NR. The UE now starts monitoring the SCell. The test equipment sends a MAC message for activation of the SCell.

The point in time at which the MAC message is received at the UE antenna connector, in a slot # denoted m, defines the start of time period T2. The UE shall be able to report valid CSI in PSCell for the activated SCell at latest in slot , as defined in clause 8.3. The UE shall start reporting CSI in PSCell in slot (m+k) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PSCell interruption due to activation of SCell shall occur in the slot to slot , as defined in clause 8.3, where is the interruption length given in section 8.2. Any E-UTRA PCell interruption due to activation of SCell shall occur in the subframe to subframe , where and are the index of the first and last subframe of E-UTRA PCell which overlaps with slot m, and is the interruption length given in TS 36.133 [14] section 7.32.

Time period T3 starts when a MAC message for deactivation of SCell, sent from the test equipment to the UE in a slot # denoted n, is received at the UE antenna connector. The UE shall carry out deactivation of the SCell in a slot , as defined in clause 8.3. The starting point of any PSCell interruption due to the deactivation shall occur in the slot to , as defined in clause 8.3. The starting point of any E-UTRA PCell interruption due to the deactivation shall occur in the subframe to subframe , where and are the index of the first and last subframe of E-UTRA PCell which overlaps with slot n.

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PSCell during activation and deactivation of SCell, respectively.

The test equipment verifies the activation time by counting the slots from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the slots from the time when the SCell deactivation command is sent until CSI reporting for SCell is discontinued.

**Table A.4.5.3.1.1-1: known FR1 SCell activation in non-DRX for 160ms SCell measurement cycle supported test configurations**

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

**Table A.4.5.3.1.1-2: General test parameters for known FR1 SCell activation case, 160ms SCell measurement cycle**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1,2,3 | One E-UTRAN radio channel (1) and two NR radio channel (2,3) are used for this test |
| Active PCell |  | Cell 1 | Primary cell on E-UTRAN RF channel number 1.  As specified in clause A.3.7.2.1 |
| Active PSCell |  | Cell 2 | Primary secondary cell on NR RF channel number 2. |
| Configured deactivated SCell |  | Cell 3 | Configured deactivated secondary cell on NR RF channel number 3 |
| CP length |  | Normal |  |
| DRX |  | OFF | Continuous monitoring of primary cell |
| CQI/PMI periodicity and offset configuration index |  | 0 | CQI reporting for SCell every second subframe |
| Cell-individual offset for cells on E-UTRA RF channel number | dB | 0 | Individual offset for cells on primary component carrier. |
| Cell-individual offset for cells on NR channel number | dB | 0 | Individual offset for cells on secondary component carrier. |
| SCell measurement cycle (measCycleSCell) | ms | 160 |  |
| Cell3 timing offset to cell2 | μs | 0 |  |
| Time alignment error between cell3 and cell2 | μs | ≤ Time alignment error as specified in TS 38.104 [13] clause 6.5.3.1. | The value of time alignment error depends upon the type of carrier aggregation. |
| T1 | s | 7 | During this time the PSCell shall be known and the SCell configured and detected. |
| T2 | s | 1 | During this time the UE shall activate the SCell. |
| T3 | s | 1 | During this time the UE shall deactivate the SCell. |
| THARQ | ms | k1NR slot length | k1 is a number of slots indicated by the PDSCH-to-HARQ\_feedback timing indicator field in a corresponding DCI format or provided by *dl-DataToUL-ACK* if the PDSCH-to-HARQ feedback timing field is not present in the DCI format, the value is defined in 38.213 [3] |
| TCSI\_Reporting | ms | 2 | the delay uncertainty in acquiring the first available CSI reporting resources as specified in TS 38.331 [2] |
| k | ms |  | As specified in clause 4.3 of TS 38.213 [3] |

**Table A. 4.5.3.1.1-3: Cell specific test parameters for known FR1 SCell activation case, 160ms SCell measurement cycle**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | | **Unit** | Cell 2 | | | Cell 3 | | |
| T1 | T2 | T3 | T1 | T2 | T3 |
| SSB ARFCN | | |  | freq1 | | | freq2 | | |
| Duplex mode | Config 1,4 | |  | FDD | | | | | |
| Config 2,3,5,6 | | TDD | | | | | |
| TDD configuration | Config 1,4 | |  | Not Applicable | | | | | |
| Config 2,5 | | TDDConf.1.1 | | | | | |
| Config 3,6 | | TDDConf.2.1 | | | | | |
| BWchannel | Config 1,4 | | MHz | 10: NRB,c = 52 | | | | | |
| Config 2,5 | | 10: NRB,c = 52 | | | | | |
| Config 3,6 | | 40: NRB,c = 106 | | | | | |
|  |  | |  |  | | | | | |
|  | |  | | | | | |
|  | |  | | | | | |
| DL initial BWP configuration | Config 1, 2, 3, 4, 5, 6 | |  | DLBWP.0.1 | | | | | |
| DL dedicated BWP configuration | Config 1, 2, 3, 4, 5, 6 | |  | DLBWP.1.1 | | | | | |
| UL initial BWP configuration | Config 1, 2, 3, 4, 5, 6 | |  | ULBWP.0.1 | | | | | |
| UL dedicated BWP configuration | Config 1, 2, 3, 4, 5, 6 | |  | ULBWP.1.1 | | | | | |
| DRx Cycle | | | ms | Not Applicable | | | | | |
| PDSCH Reference measurement channel | Config 1,4 | |  | SR.1.1 FDD | | | SR.1.1 FDD | | |
| Config 2,5 | | SR.1.1 TDD | | | SR.1.1 TDD | | |
| Config 3,6 | | SR.2.1 TDD | | | SR.2.1 TDD | | |
| RMSI CORESET Reference Channel | Config 1,4 | |  | CR.1.1 FDD | | | CR.1.1 FDD | | |
| Config 2,5 | | CR.1.1 TDD | | | CR.1.1 TDD | | |
| Config 3,6 | | CR.2.1 TDD | | | CR.2.1 TDD | | |
| RMC CORESET Reference Channel | Config 1,4 | |  | CCR.1.1 FDD | | | CCR.1.1 FDD | | |
| Config 2,5 | |  | CCR.1.1 TDD | | | CCR.1.1 TDD | | |
| Config 3,6 | |  | CCR.2.1 TDD | | | CCR.2.1 TDD | | |
| TRS configuration | Config 1,4 | |  | TRS.1.1 FDD | | | TRS.1.1 FDD | | |
| Config 2,5 | |  | TRS.1.1 TDD | | | TRS.1.1 TDD | | |
| Config 3,6 | |  | TRS.1.2 TDD | | | TRS.1.2 TDD | | |
| OCNG Patterns | | |  | OP.1 | | | | | |
| SMTC configuration | | |  | SMTC.1 | | | | | |
| SSB configuration | Config 1,2,4,5 | |  | SSB.1 FR1 | | | | | |
| Config 3,6 | | SSB.2 FR1 | | | | | |
| PDSCH/PDCCH subcarrier spacing | Config 1,2,4,5 | | kHz | 15 kHz | | | | | |
| Config 3,6 | | 30kHz | | | | | |
| EPRE ratio of PSS to SSS | | | dB | 0 | | | | | |
| EPRE ratio of PBCH DMRS to SSS | | |
| EPRE ratio of PBCH to PBCH DMRS | | |
| EPRE ratio of PDCCH DMRS to SSS | | |
| EPRE ratio of PDCCH to PDCCH DMRS | | |
| EPRE ratio of PDSCH DMRS to SSS | | |
| EPRE ratio of PDSCH to PDSCH | | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | | |
| Note2 | | | dBm/15kHz | -104 | | | | | |
| Note2 | | Config 1,2,4,5 | dBm/SCS | -104 | | | | | |
| Config 3,6 | -101 | | | | | |
|  | | | dB | 17 | | | | | |
|  | | | dB | 17 | | | | | |
| SS-RSRPNote3 | | Config 1,2,4,5 | dBm/SCS | -87 | | | | | |
| Config 3,6 | -84 | | | | | |
| SCH\_RP Note 3 | | | dBm/15 kHz | -87 | | | | | |
| Propagation condition | | | - | 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 SCH\_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.] | | | | | | | | | |

##### A.4.5.3.1.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell in slot (m+k), or in slot as defined in clause 8.3 if slot (m+k) was subject to interruption. Whether CSI report in slot (m+k) was interrupted is checked by monitoring ACK/NACK sent in PCell in slot (m+k).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a slot , Tactivation\_time = TFirstSSB+ 5ms, as defined in clause 8.3.

During T3 the UE shall stop sending CSI reports for SCell at latest in a slot , as defined in clause 8.3.

During T2 interruption of PSCell during SCell activation shall not happen outside the slot to , and interruption of E-UTRA PCell during SCell activation shall not happen outside the subframe to subframe, as defined in clause 8.3.

During T3 the starting point of interruption of PSCell during SCell deactivation shall not happen outside the slot to , as defined in clause 8.3 and the starting point of interruption of E-UTRA PCell during SCell deactivation shall not happen outside the subframe to subframe .

The interruption of PSCell shall not be more than the values specified for EN-DC in Clause 8.2.1.2.4.

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

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a slot as defined in clause 8.3 then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

#### A.4.5.3.2 SCell Activation and deactivation of known SCell in FR1 for 320 ms SCell measurement cycle

##### A.4.5.3.2.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in clause A.4.5.3.1.1. The supported test configurations are the same as defined in clause A.4.5.3.1.1. The test parameters are the same except those described in the following clause. The listed parameter values in Tables A.4.5.3.2.1-1 will replace the values of corresponding parameters in Tables A.4.5.3.1.1-2.

**Table A.4.5.3.2.1-1: General test parameters for known FR1 SCell activation case, 320 ms SCell measurement cycle**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| SCell measurement cycle (measCycleSCell) | ms | 320 |  |

##### A.4.5.3.2.2 Test Requirements

The test requirements defined in clause A.4.5.3.1.2 shall apply to this test case, except Tactivation\_time will be replaced with the value TFirstSSB\_MAX + Trs + 5ms.

#### A.4.5.3.3 SCell Activation and deactivation of unknown SCell in FR1

##### A.4.5.3.3.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in clause 8.3, when the SCell in FR1 is unknown by the UE at the time of activation.

The supported test configurations are the same as defined in clause A.4.5.3.1.1. The test parameters are the same except those described in the following clause. The listed parameter values in Tables A.4.5.3.3.1-1 will replace the values of corresponding parameters in Tables A.4.5.3.1.1-2. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, E-UTRA has one cell, NR has two cells. Cell 1 and Cell 2 have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on E-UTRAN and Cell 2 (PSCell) on NR, but is not aware of Cell 3 (SCell) on NR. The UE is monitoring the PCell and PSCell. The UE shall be continuously scheduled in the PCell and PSCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (Cell 3) becomes configured on NR. During T1 the SCell is powered off and UE is not aware of SCell.

A MAC message for activation of SCell is sent by the test equipment 100ms after the RRC message, in a slot # denoted m. The point in time at which the MAC message for activation of SCell is received at the UE antenna connector defines the start of time period T2. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2. The UE shall be able to report valid CSI for the activated SCell at latest in slot as defined in clause 8.3 provided the SCell can be successfully detected on the first attempt. The UE shall start reporting CSI in slot (m+k) and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PSCell interruption due to activation of SCell shall occur in the slot to slot, as defined in clause 8.3, where is the interruption length given in section 8.2. Any E-UTRA PCell interruption due to activation of SCell shall occur in the subframe to subframe, where and are the index of the first and last subframe of E-UTRA PCell which overlaps with slot m, and is the interruption length given in TS 36.133 [14] section 7.32.

Time period T3 starts when a MAC message for deactivation of the SCell, sent from the test equipment to the UE in a slot # denoted n, is received at the UE antenna connector. The UE shall carry out deactivation of the SCell at latest in slot as defined in clause 8.3. The starting point of any PSCell interruption due to the deactivation shall occur in the slot to , as defined in clause 8.3. The starting point of any E-UTRA PCell interruption due to the deactivation shall occur in the subframe to subframe , where and are the index of the first and last subframe of E-UTRA PCell which overlaps with slot n.

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PSCell during activation of SCell, respectively.

The test equipment verifies the activation time by counting the slots from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the slots from the time when the SCell1 deactivation command is sent until CSI reporting for SCell1 is discontinued.

**Table A.4.5.3.3.1-1: General test parameters for unknown FR1 SCell activation case, 160ms SCell measurement cycle**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| T1 | ms | 100 | During this time the PSCell shall be known and the SCell configured, but not detected. |

##### A.4.5.3.3.2 Test Requirements

The test requirements defined in clause A.4.5.3.1.2 shall apply to this test case, except Tactivation\_time will be replaced with the value TFirstSSB\_MAX + TSMTC\_MAX + 2\*Trs + 5ms as defined in clause 8.3.

**<End of modified section 1>**

**<Start of modified section 2>**

A.6.5.3 SCell Activation and Deactivation Delay

#### A.6.5.3.1 SCell Activation and deactivation of known SCell in FR1 in non-DRX for 160ms SCell measurement cycle

##### A.6.5.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in clause 8.3, when the SCell in FR1 is known by the UE at the time of activation.

The supported test configurations are shown in table A.6.5.3.1.1-1 below. The test parameters are given in Tables A.6.5.3.1.1-2 and cell-specific parameters in A.6.5.3.1.1-3 below. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two NR carriers, each with one cell. Both cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1, but is not aware of Cell2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (Cell 2) becomes configured on radio channel 2. The UE now starts monitoring the SCC. The test equipment sends a MAC message for activation of the SCell.

The point in time at which the MAC message is received at the UE antenna connector, in slot # denoted n, defines the start of time period T2. The UE shall be able to report valid CSI in PCell for the activated SCell at latest in slot , as defined in clause 8.3. The UE shall start reporting CSI in PCell in slot and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCell shall occur in the slot to , as defined in clause 8.3, where is the interruption length given in section 8.2.

Time period T3 starts when a MAC message for deactivation of SCell, sent from the test equipment to the UE in a slot # denoted m, is received at the UE antenna connector. The UE shall carry out deactivation of the SCell in a slot , as defined in clause 8.3, and The starting point of any PCell interruption due to the deactivation shall occur in the slot to , as defined in clause 8.3.

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell, respectively.

The test equipment verifies the activation time by counting the slots from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the slots from the time when the SCell deactivation command is sent until CQI reporting for SCell is discontinued.

**Table A.6.5.3.1.1-1: known FR1 SCell activation in non-DRX for 160ms SCell measurement cycle supported test configurations**

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

**Table A.6.5.3.1.1-2: General test parameters for known FR1 SCell activation case, 160ms SCell measurement cycle**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1,2 | Two NR radio channel (1, 2) are used for this test |
| Active PCell |  | Cell 1 | Primary cell on NR RF channel number 1. |
| Configured deactivated SCell |  | Cell 2 | Configured deactivated secondary cell on NR RF channel number 2 |
| CP length |  | Normal |  |
| DRX |  | OFF | Continuous monitoring of primary cell |
| CQI/PMI periodicity and offset configuration index |  | 0 | CQI reporting for SCell every second subframe |
| Cell-individual offset for cells on NR channel number | dB | 0 | Individual offset for cells on primary component carrier. |
| SCell measurement cycle (measCycleSCell) | ms | 160 |  |
| Cell2 timing offset to cell1 | μs | 0 |  |
| Time alignment error between cell2 and cell1 | μs | ≤ Time alignment error as specified in TS 38.104 [13] clause 6.5.3.1. | The value of time alignment error depends upon the type of carrier aggregation. |
| T1 | s | 7 | During this time the PSCell shall be known and the SCell configured and detected. |
| T2 | s | 1 | During this time the UE shall activate the SCell. |
| T3 | s | 1 | During this time the UE shall deactivate the SCell. |
| THARQ | ms | k1NR slot length | k1 is a number of slots and is indicated by the PDSCH-to-HARQ-timing-indicator field in the DCI format, if present, or provided by *dl-DataToUL-ACK*, the value of k should be the minimum value defined in TS 38.213 [3] depends on UE’s capability |
| TCSI\_Reporting | ms | 2 | the delay uncertainty in acquiring the first available CSI reporting resources as specified in TS 38.331 [2] |

**Table A.6.5.3.1.1-3: Cell specific test parameters for known FR1 SCell activation case, 160ms SCell measurement cycle**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | | | **Unit** | **T1** | | | **T2** | | **T3** | | |
|  | | | |  | **Cell 1** | **Cell 2** | | **Cell 1** | **Cell 2** | **Cell 1** | **Cell 2** | |
| Duplex mode | | Config 1 | |  | FDD | | | | | | | |
|  | | Config 2,3 | |  | TDD | | | | | | | |
| TDD configuration | | Config 1 | |  | Not applicable | | | | | | | |
|  | | Config 2 | |  | TDDConf.1.1 | | | | | | | |
|  | | Config 3 | |  | TDDConf.1.2 | | | | | | | |
| BWchannel | | Config 1,2 | | MHz | 10: NRB,c = 52 | | | | | | | |
|  | | Config 3 | |  | 40: NRB,c = 106 | | | | | | | |
| Initial BWP configuration | | | |  | DLBWP.0.2 | | | | | | | |
| TCI state | | | |  | TCI.State.0 | | | | | | | |
| TRS Configuration | | | |  | TRS.1.1 TDD | | | | | | | |
| PDSCH Reference measurement channel | | Config 1 | |  | SR.1.1 FDD | | - | SR.1.1 FDD | - | SR.1.1 FDD | | - |
|  | | Config 2 | |  | SR.1.1 TDD | |  | SR.1.1 TDD |  | SR.1.1 TDD | |  |
|  | | Config 3 | |  | SR2.1 TDD | |  | SR2.1 TDD |  | SR2.1 TDD | |  |
| Dedicated CORESET parameters | | Config 1 | |  | CCR.1.1 FDD | | - | CCR.1.1 FDD | - | CCR.1.1 FDD | | - |
|  | | Config 2 | |  | CCR.1.1 TDD | |  | CCR.1.1 TDD |  | CCR.1.1 TDD | |  |
|  | | Config 3 | |  | CCR2.1 TDD | |  | CCR2.1 TDD |  | CCR2.1 TDD | |  |
| RMSI CORESET parameters | | Config 1 | |  | CR.1.1 FDD | | - | CR.1.1 FDD | - | CR.1.1 FDD | | - |
|  | | Config 2 | |  | CR.1.1 TDD | |  | CR.1.1 TDD |  | CR.1.1 TDD | |  |
|  | | Config 3 | |  | CR2.1 TDD | |  | CR2.1 TDD |  | CR2.1 TDD | |  |
| OCNG Patterns | | | |  | OP.1 | | | | | | | |
| SSB Configuration | Config 1,2 | | |  | SSB.1 FR1 | | | | | | | |
|  | Config 3 | | |  | SSB.2 FR1 | | | | | | | |
| SMTC configuration | | | |  | SMTC.1 | | | | | | | |
| EPRE ratio of PSS to SSS | | | | dB | 0 | | | | | | | |
| EPRE ratio of PBCH DMRS to SSS | | | |  |  | | | | | | | |
| EPRE ratio of PBCH to PBCH DMRS | | | |  |  | | | | | | | |
| EPRE ratio of PDCCH DMRS to SSS | | | |  |  | | | | | | | |
| EPRE ratio of PDCCH to PDCCH DMRS | | | |  |  | | | | | | | |
| EPRE ratio of PDSCH DMRS to SSS | | | |  |  | | | | | | | |
| EPRE ratio of PDSCH to PDSCH | | | |  |  | | | | | | | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | | | |  |  | | | | | | | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | | | |  |  | | | | | | | |
| Note2 | | | Config 1,2,4,5 | dBm/15kHz | -104 | | | | | | | |
|  | | | Config 3,6 |  | -101 | | | | | | | |
|  | | | | dB | 17 | | | | | | | |
|  | | | | dB | 17 | | | | | | | |
| SS-RSRPNote3 | | | Config 1,2,4,5 | dBm/SCS | -87 | | | | | | | |
|  | | | Config 3,6 |  | -84 | | | | | | | |
| SCH\_RP Note 3 | | | | dBm/15 kHz | -87 | | | | | | | |
| Propagation condition | | | | - | 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 SCH\_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2. | | | | | | | | | | | | |

##### A.6.5.3.1.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell in a slot .

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a slot , Tactivation\_time = TFirstSSB+ 5ms, as defined in clause 8.3.

During T3 the UE shall stop sending CSI reports for SCell at latest in a slot , as defined in clause 8.3.

During T2 interruption of PCell / PSCell during SCell activation shall not happen outside the slot to , as defined in clause 8.3.

During T3 the starting point of interruption of PCell during SCell deactivation shall not happen outside the slot to , as defined in clause 8.3.

The interruption on any activated serving cell shall not be more than the values specified for SA in clause 8.2.2.2.2.

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

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a slot as defined in clause 8.3 then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

#### A.6.5.3.2 SCell Activation and deactivation of known SCell in FR1 in non-DRX for 320ms SCell measurement cycle

##### A.6.5.3.2.1 Test Purpose and Environment

The purpose of this test case is the same as for the test defined in clause A.6.5.3.1.1. The supported test configurations are the same as defined in clause A.6.5.3.1.1. The test parameters are the same except those described in the following clause. The listed parameter values in Tables A.6.5.3.2.1-1 will replace the values of corresponding parameters in Tables A.4.5.3.1.1-1.

**Table A.6.5.3.2.1-1: General test parameters for known FR1 SCell activation case, 320ms SCell measurement cycle**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| SCell measurement cycle (measCycleSCell) | ms | 320 |  |

##### A.6.5.3.2.2 Test Requirements

The test requirements defined in clause A.6.5.3.1.2 shall apply to this test case, except Tactivation\_time will be replaced with the value TFirstSSB\_MAX + Trs + 5ms.

#### A.6.5.3.3 SCell Activation and deactivation of unknown SCell in FR1 in non-DRX

##### A.6.5.3.3.1 Test Purpose and Environment

The purpose of this test is to verify that the SCell activation and deactivation times are within the requirements stated in clause 8.3, when the SCell in FR1 is unknown by the UE at the time of activation.

The supported test configurations are the same as defined in clause A.6.5.3.1.1. The test parameters are the same except those described in the following clause. The listed parameter values in Tables A.6.5.3.3.1-1 will replace the values of corresponding parameters in Tables A.6.5.3.1.1-1. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two NR carriers, each with one cell. Both cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1, but is not aware of Cell2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

At the beginning of T1 the UE receives an RRC message by which the SCell (Cell 2) becomes configured on radio channel 2. The UE now starts monitoring the SCC. The test equipment sends a MAC message for activation of the SCell.

The point in time at which the MAC message is received at the UE antenna connector, in slot # denoted n, defines the start of time period T2. The UE shall be able to report valid CSI in PCell for the activated SCell at latest in slot , as defined in clause 8.3. The UE shall start reporting CSI in PCell in slot and shall report CQI index 0 (out-of-range) until the SCell activation has been completed. Any PCell interruption due to activation of SCell shall occur in the slot to , as defined in clause 8.3, where is the interruption length given in section 8.2.

Time period T3 starts when a MAC message for deactivation of SCell, sent from the test equipment to the UE in a slot # denoted m, is received at the UE antenna connector. The UE shall carry out deactivation of the SCell in a slot , as defined in clause 8.3, and the starting point of any PCell interruption due to the deactivation shall occur in the slot to , as defined in clause 8.3.

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of SCell, respectively.

The test equipment verifies the activation time by counting the slots from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the slots from the time when the SCell deactivation command is sent until CQI reporting for SCell is discontinued.

**Table A.6.5.3.3.1-1: General test parameters for unknown FR1 SCell activation case, 160ms SCell measurement cycle**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| T1 | ms | 100 | During this time the PSCell shall be known and the SCell configured, but not detected. |

##### A.6.5.3.3.2 Test Requirements

The test requirements defined in clause A.6.5.3.1.2 shall apply to this test case, except Tactivation\_time will be replaced with the value TFirstSSB\_MAX + TSMTC\_MAX + 2\*Trs + 5ms as defined in clause 8.3.

**<End of modified section 2>**