**3GPP TSG-RAN4 Meeting #95-e *R4-2007677***

**Electronic Meeting, 25th May – 5th June 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **0761** | **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 interruption TCs | | | | | | | | | |
|  |  | | | | | | | | | |
| ***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:*** | | **Formal CR of R4-2004241 (endosed in RAN4 #94-ebis)**   1. RF channel numbers are incorrect in 4.5.2.3/4.5.2.4/4.5.2.5/4.5.2.6/5.5.2.3/5.5.2.4/5.5.2.5/5.5.2.6. An additional RF channel shall be allocated for the SCell,otherwise IO calculation will be wrong. 2. Interruption requirements for sync EN-DC case is wrongly used as test requirements in 4.5.2.6. It should be Interruption requirements for async EN-DC. 3. Interruption requirements for SCell addition is wrongly used as test requirements in 4.5.2.3/4.5.2.4. It should be Interruption requirements for measuring on deactivated SCells. 4. Test requirement of 5.5.2.5/5.5.2.6 are wrong. Interruption requirements for the case that E-UTRA aggressor and NR victim in the same band when NR SCS = 120kHz is already removed in core requirements since SCS=120kHz is for FR2 only. So there is no normarative reference for Table A.5.5.2.5.2-2 and Table A.5.5.2.6.2-2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. The values of Io in A.4.5.2 and A.6.5.2 are corrected. (Already agreed in R4-19114428 in RAN4 #93 meeting) 2. The 3rd RF channel is added and allocated to SCell in test case 4.5.2.3/4.5.2.4/4.5.2.5/4.5.2.6/5.5.2.3/5.5.2.4/5.5.2.5/5.5.2.6. 3. Test requirements in 4.5.2.3/4.5.2.4/4.5.2.6 is corrected. 4. Table A.5.5.2.5.2-2 and Table A.5.5.2.6.2-2 are voided. Reference of these two tables in test cases are also removed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Test requirements are incorrect. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.4.5.2, A.5.5.2, A.6.5.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 modified section 1>**

A.4.5.2.3 E-UTRAN – NR FR1 interruptions during measurements on deactivated NR SCC in synchronous EN-DC

A.4.5.2.3.1 Test Purpose and Environment

The purpose of this test is to verify E-UTRAN PCell and NR PSCell interruptions during the measurement on the deactivated NR SCC, the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for E-UTRAN PCell and NR PSCell in EN-DC specified in TS 38.133 section 8.2.1.2. Supported test configurations are shown in table A.4.5.2.3.1-1.

The general test parameters and NR cell specific test parameters are given in Table A.4.5.2.3.1-2 and A.4.5.2.3.1-3 below. And the E-UTRAN cell specific test parameters can refer to Table A.3.7.2.1-1. In the test there are three cells: Cell1, Cell2 and Cell3. Cell1 is LTE PCell, Cell2 and Cell3 is NR PSCell and NR deactivated SCell. Cell1 shall be configured as LTE PCell and Cell2 shall be configured as NR PSCell. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE is connected to Cell1 and Cell2. The point in time at which the RRC message including *measCycleSCell* or *allowInterruptions* for the deactivated NR SCells is received at the UE antenna connector, defines the start of time period T1. During T1, LTE PCell and NR PSCell are continuously scheduled in DL.

**Table A.4.5.2.3.1-1: Interruptions during measurements on deactivated NR SCC supported test configurations**

|  |  |
| --- | --- |
| **Config** | **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.4.5.2.3.1-2: General test parameters for E-UTRAN – NR interruptions during measurements on deactivated NR SCC in synchronous EN-DC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1, 2, 3 | One is E-UTRAN RF channel and the other two are NR RF channels |
| Active PCell |  | Cell1 | PCell on E-UTRAN RF channel number 1. |
| Active PSCell |  | Cell2 | PSCell on NR RF channel number 2. |
| Configured deactivated SCell |  | Cell3 | Deactivated SCell on NR RF channel number 3. |
| CP length |  | Normal | Applicable to Cell1, Cell2 and Cell3 |
| DRX |  | OFF |  |
| Measurement gap pattern Id |  | OFF |  |
| SCell measurement cycle (measCycleSCell) | ms | 640 |  |
| T1 | s | 10 |  |

**Table A.4.5.2.3.1-3: NR cell specific test parameters for E-UTRAN – NR interruptions during measurements on deactivated NR SCC in synchronous EN-DC**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Cell2** | **Cell3** |
| Frequency Range | |  | FR1 | FR1 |
| Duplex mode | Config 1,4 |  | FDD | FDD |
| Config 2,3,5,6 | TDD | TDD |
| TDD configuration | Config 1,4 |  | Not Applicable | Not Applicable |
| Config 2,5 | TDDConf.1.1 | TDDConf.1.1 |
| Config 3,6 | TDDConf.2.1 | TDDConf.2.1 |
| BWchannel | Config 1,4 |  | 10: NRB,c = 52 | 10: NRB,c = 52 |
| Config 2,5 | 10: NRB,c = 52 | 10: NRB,c = 52 |
| Config 3,6 | 40: NRB,c = 106 | 40: NRB,c = 106 |
| Initial DL BWP Configuration | Config 1,4 |  | DLBWP.0.1 | DLBWP.0.1 |
| Config 2,5 | DLBWP.0.1 | DLBWP.0.1 |
| Config 3,6 | DLBWP.0.1 | DLBWP.0.1 |
| Dedicated DL BWP Configuration | Config 1,4 |  | DLBWP.1.1 | DLBWP.1.1 |
| Config 2,5 | DLBWP.1.1 | DLBWP.1.1 |
| Config 3,6 | DLBWP.1.1 | DLBWP.1.1 |
| Initial UL BWP Configuration | Config 1,4 |  | ULBWP.0.1 | ULBWP.0.1 |
| Config 2,5 | ULBWP.0.1 | ULBWP.0.1 |
| Config 3,6 | ULBWP.0.1 | ULBWP.0.1 |
| Dedicated UL BWP Configuration | Config 1,4 |  | ULBWP.1.1 | ULBWP.1.1 |
| Config 2,5 | ULBWP.1.1 | ULBWP.1.1 |
| Config 3,6 | ULBWP.1.1 | ULBWP.1.1 |
| PDSCH Reference measurement channel | Config 1,4 |  | SR.1.1 FDD | - |
| Config 2,5 | SR.1.1 TDD | - |
| Config 3,6 | SR.2.1 TDD | - |
| RMSI CORESET parameters | 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 |
| PDCCH CORESET parameters | 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 | OP.1 |
| SMTC Configuration | |  | SMTC.1 | SMTC.1 |
| TCI state | |  | TCI.State.0 | TCI.State.0 |
| SSB Configuration | Config 1,2,4,5 |  | SSB.1 FR1 | SSB.1 FR1 |
| Config 3,6 | SSB.2 FR1 | SSB.2 FR1 |
| Correlation Matrix and Antenna Configuration | |  | 1x2 Low | 1x2 Low |
| EPRE ratio of PSS to SSS | | dB | 0 | 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) | |
| NocNote 2 | | dBm/15 kHz | -104 | -104 |
| SS-RSRP Note 3 | | dBm/15 kHz | -87 | -87 |
| Ês/Iot | | dB | 17 | 17 |
| Ês/Noc | | dB | 17 | 17 |
| IoNote3 | Config 1,2,4,5 | dBm/  9.36MHz | -58.96 | -58.96 |
| Config 3,6 | dBm/  38.16MHz | -52.86 | -52.86 |
| Time offset to Cell1 Note 4 | | μs | 33 | 33 |
| Time offset to Cell2 Note 5 | | μs | - | 3 |
| Propagation Condition | |  | 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 modeled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselvess.  Note 4: Receive time difference of signals received between subframe timing boundary of E-UTRA PCell and slot timing boundary of PSCell at the UE antenna connector including time alignment error between the two cells  Note 5: Receive time difference between slot boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells. | | | | |

A.4.5.2.3.2 Test Requirements

The UE shall be continuously scheduled in LTE PCell and NR PSCell during the entire length of T1. During the time duration T1 the UE shall transmit at least 99.5% of ACK/NACK on NR PSCell. The UE is only allowed to cause interruptions immediately before and immediately after an SMTC. Each interruption on NR PSCell shall not exceed the value defined in Table A.4.5.2.3.2-1 if the NR PSCell is not in the same band as the deactivated SCell or Table A.4.5.2.3.2-2 if the NR PSCell is in the same band as the deactivated SCell.

**Table A.4.5.2.3.2-1: Interruption duration if the NR PSCell is not in the same band as the deactivated SCell**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length** |
| 0 | 1 | 1 |
| 1 | 0.5 | 1 |

**Table A.4.5.2.3.2-2: Interruption duration if the NR PSCell is in the same band as the deactivated SCell**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length** |
| 0 | 1 | 1 + SMTC duration |
| 1 | 0.5 | 1 + SMTC duration |

Each interruption on E-UTRAN PCell shall not exceed 1ms + SMTC duration subframes for intraband EN-DC, 1 subframe for synchronous interband EN-DC.

The rate of correct events observed during repeated tests shall be at least 90%.

A.4.5.2.4 E-UTRAN – NR FR1 interruptions during measurements on deactivated NR SCC in asynchronous EN-DC

A.4.5.2.4.1 Test Purpose and Environment

The purpose of this test is to verify E-UTRAN PCell and NR PSCell interruptions during the measurement on the deactivated NR SCC, the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for E-UTRAN PCell and NR PSCell in EN-DC specified in TS 38.133 section 8.2.1. Supported test configurations are shown in table A.4.5.2.4.1-1.

The general test parameters and NR cell specific test parameters are given in Table A.4.5.2.4.1-2 and A.4.5.2.4.1-3 below. And the E-UTRAN cell specific test parameters can refer to Table A.3.7.2.1-1. In the test there are three cells: Cell1, Cell2 and Cell3. Cell1 is LTE PCell, Cell2 and Cell3 is NR PSCell and NR deactivated SCell. Cell1 shall be configured as LTE PCell and Cell2 shall be configured as NR PSCell. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE is connected to Cell1 and Cell2. The point in time at which the RRC message including *measCycleSCell* or *allowInterruptions* for the deactivated NR SCells is received at the UE antenna connector, defines the start of time period T1. During T1, LTE PCell and NR PSCell are continuously scheduled in DL.

**Table A.4.5.2.4.1-1: Interruptions during measurements on deactivated NR SCC supported test configurations**

|  |  |
| --- | --- |
| **Config** | **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.4.5.2.4.1-2: General test parameters for E-UTRAN – NR interruptions during measurements on deactivated NR SCC in asynchronous EN-DC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1, 2, 3 | One is E-UTRAN RF channel and the other two are NR RF channels |
| Active PCell |  | Cell1 | PCell on E-UTRAN RF channel number 1. |
| Configured PSCell |  | Cell2 | PSCell on NR RF channel number 2. |
| Configured deactivated SCell |  | Cell3 | Deactivated SCell on NR RF channel number 3. |
| CP length |  | Normal | Applicable to Cell1, Cell2 and Cell3 |
| DRX |  | OFF |  |
| Measurement gap pattern Id |  | OFF |  |
| SCell measurement cycle (measCycleSCell) | ms | 640 |  |
| T1 | s | 10 |  |

**Table A.4.5.2.4.1-3: NR cell specific test parameters for E-UTRAN – NR interruptions during measurements on deactivated NR SCC in asynchronous EN-DC**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Cell2** | **Cell3** |
| Frequency Range | |  | FR1 | FR1 |
| Duplex mode | Config 1,4 |  | FDD | FDD |
| Config 2,3,5,6 | TDD | TDD |
| TDD configuration | Config 1,4 |  | Not Applicable | Not Applicable |
| Config 2,5 | TDDConf.1.1 | TDDConf.1.1 |
| Config 3,6 | TDDConf.2.1 | TDDConf.2.1 |
| BWchannel | Config 1,4 |  | 10: NRB,c = 52 | 10: NRB,c = 52 |
| Config 2,5 | 10: NRB,c = 52 | 10: NRB,c = 52 |
| Config 3,6 | 40: NRB,c = 106 | 40: NRB,c = 106 |
| Initial BWP Configuration | Config 1,4 |  | DLBWP.0.1 | DLBWP.0.1 |
| Config 2,5 | DLBWP.0.1 | DLBWP.0.1 |
| Config 3,6 | DLBWP.0.1 | DLBWP.0.1 |
| Dedicated DL BWP Configuration | Config 1,4 |  | DLBWP.1.1 | DLBWP.1.1 |
| Config 2,5 | DLBWP.1.1 | DLBWP.1.1 |
| Config 3,6 | DLBWP.1.1 | DLBWP.1.1 |
| Initial UL BWP Configuration | Config 1,4 |  | ULBWP.0.1 | ULBWP.0.1 |
| Config 2,5 | ULBWP.0.1 | ULBWP.0.1 |
| Config 3,6 | ULBWP.0.1 | ULBWP.0.1 |
| Dedicated UL BWP Configuration | Config 1,4 |  | ULBWP.1.1 | ULBWP.1.1 |
| Config 2,5 | ULBWP.1.1 | ULBWP.1.1 |
| Config 3,6 | ULBWP.1.1 | ULBWP.1.1 |
| PDSCH Reference measurement channel | Config 1,4 |  | SR.1.1 FDD | - |
| Config 2,5 | SR.1.1 TDD | - |
| Config 3,6 | SR.2.1 TDD | - |
| RMSI CORESET parameters | 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 |
| PDCCH CORESET parameters | 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 | OP.1 |
| SSB Configuration | Config 1,2,4,5 |  | SSB.1 FR1 | SSB.1 FR1 |
| Config 3,6 | SSB.2 FR1 | SSB.2 FR1 |
| SMTC Configuration |  |  | SMTC.1 | SMTC.1 |
| TCI state | |  | TCI.State.0 | TCI.State.0 |
| Correlation Matrix and Antenna Configuration | |  | 1x2 Low | 1x2 Low |
| EPRE ratio of PSS to SSS | | dB | 0 | 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) | |
| NocNote 2 | | dBm/15 kHz | -104 | -104 |
| SS-RSRP Note 3 | | dBm/15 kHz | -87 | -87 |
| Ês/Iot | | dB | 17 | 17 |
| Ês/Noc | | dB | 17 | 17 |
| IoNote3 | Config 1,2,4,5 | dBm/  9.36MHz | -58.96 | -58.96 |
| Config 3,6 | dBm/  38.16MHz | -52.86 | -52.86 |
| Time offset to Cell1 Note 4 | | ms | 3 | 3 |
| Time offset to Cell2 Note 5 | | μs | - | 3 |
| Propagation Condition | |  | 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 modeled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselvess.  Note 4: Receive time difference of signals received between subframe timing boundary of E-UTRA PCell and slot timing boundary of PSCell at the UE antenna connector including time alignment error between the two cells  Note 5: Receive time difference between slot boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells. | | | | |

A.4.5.2.4.2 Test Requirements

The UE shall be continuously scheduled in LTE PCell and NR PSCell during the entire length of T1. During the time duration T1 the UE shall transmit at least 99.5% of ACK/NACK on NR PSCell. The UE is only allowed to cause interruptions immediately before and immediately after an SMTC. Each interruption on NR PSCell shall not exceed the value defined in Table A.4.5.2.4.2-1 and Table A.4.5.2.4.2-2.

**Table A.4.5.2.4.2-1: Interruption duration if the NR PSCell is not in the same band as the deactivated SCell**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length** |
| 0 | 1 | 1 |
| 1 | 0.5 | 1 |

**Table A.4.5.2.4.2-2: Interruption duration if the NR PSCell is in the same band as the deactivated SCell**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length** |
| 0 | 1 | 1 + SMTC duration |
| 1 | 0.5 | 1 + SMTC duration |

Each interruption on E-UTRAN PCell shall not exceed 1ms + SMTC duration subframes for synchronous intraband EN-DC, or 2 subframes for asynchronous interband EN-DC.

The rate of correct events observed during repeated tests shall be at least 90%.

A.4.5.2.5 E-UTRAN – NR FR1 interruptions during measurements on deactivated E-UTRAN SCC in synchronous EN-DC

A.4.5.2.5.1 Test Purpose and Environment

The purpose of this test is to verify E-UTRAN PCell and NR PSCell interruptions during the measurement on the deactivated E-UTRAN SCC, the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for E-UTRAN PCell and NR PSCell in EN-DC specified in TS38.133 section 8. 2.1.2. Supported test configurations are shown in table A.4.5.2.5.1-1.

The general test parameters and NR cell specific test parameters are given in Table A.4.5.2.5.1-2 and A.4.5.2.5.1-3 below. And the E-UTRAN cell specific test parameters can refer to Table A.3.7.2.1-1. In the test there are three cells: Cell1, Cell2 and Cell3. Cell1 and Cell3 is E-UTRAN PCell and E-UTRAN deactivated SCell, Cell2 is NR FR1 PSCell. Cell1 shall be configured as LTE PCell and Cell2 shall be configured as NR PSCell. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE is connected to Cell1 and Cell2. The point in time at which the RRC message including *measCycleSCell* or *allowInterruptions* for the deactivated E-UTRAN SCells is received at the UE antenna connector, defines the start of time period T1. During T1, LTE PCell and NR PSCell are continuously scheduled in DL.

**Table A.4.5.2.5.1-1: Interruptions during measurements on deactivated E-UTRAN SCC supported test configurations**

|  |  |
| --- | --- |
| **Config** | **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.4.5.2.5.1-2: General test parameters for E-UTRAN – NR interruptions during measurements on deactivated E-UTRAN SCC in synchronous EN-DC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1, 2, 3 | One is NR RF channel and the other two are E-UTRAN RF channels |
| Active PCell |  | Cell1 | PCell on E-UTRAN RF channel number 1. |
| Active PSCell |  | Cell2 | PSCell on NR RF channel number 2. |
| Configured deactivated SCell |  | Cell3 | Deactivated SCell on E-UTRAN RF channel number 3. |
| CP length |  | Normal | Applicable to Cell1, Cell2 and Cell3 |
| DRX |  | OFF |  |
| Measurement gap pattern Id |  | OFF |  |
| SCell measurement cycle (measCycleSCell) | ms | 640 |  |
| T1 | s | 10 |  |

**Table A.4.5.2.5.1-3: NR cell specific test parameters for E-UTRAN – NR interruptions during measurements on deactivated E-UTRAN SCC in synchronous EN-DC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Cell2** |
| Frequency Range | |  | FR1 |
| 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 |
| Initial DL BWP Configuration | Config 1,4 |  | DLBWP.0.1 |
| Config 2,5 | DLBWP.0.1 |
| Config 3,6 | DLBWP.0.1 |
| Dedicated DL BWP Configuration | Config 1,4 |  | DLBWP.1.1 |
| Config 2,5 | DLBWP.1.1 |
| Config 3,6 | DLBWP.1.1 |
| Initial UL BWP Configuration | Config 1,4 |  | ULBWP.0.1 |
| Config 2,5 | ULBWP.0.1 |
| Config 3,6 | ULBWP.0.1 |
| Dedicated UL BWP Configuration | Config 1,4 |  | ULBWP.1.1 |
| Config 2,5 | ULBWP.1.1 |
| Config 3,6 | ULBWP.1.1 |
| PDSCH Reference measurement channel | Config 1,4 |  | SR.1.1 FDD |
| Config 2,5 | SR.1.1 TDD |
| Config 3,6 | SR.2.1 TDD |
| RMSI CORESET parameters | Config 1,4 |  | CR.1.1 FDD |
| Config 2,5 | CR.1.1 TDD |
| Config 3,6 | CR.2.1 TDD |
| PDCCH CORESET parameters | Config 1,4 |  | CCR.1.1 FDD |
| Config 2,5 | CCR.1.1 TDD |
| Config 3,6 | CCR.2.1 TDD |
| TRS configuration | Config 1,4 |  | TRS.1.1 FDD |
| Config 2,5 | TRS.1.1 TDD |
| Config 3,6 | TRS.1.2 TDD |
| OCNG Patterns | |  | OP.1 |
| SMTC Configuration | |  | SMTC.1 |
| TCI state | |  | TCI.State.0 |
| SSB Configuration | Config 1,2,4,5 |  | SSB.1 FR1 |
| Config 3,6 | SSB.2 FR1 |
| Correlation Matrix and Antenna Configuration | |  | 1x2 Low |
| 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) | |
| NocNote 2 | | dBm/15 kHz | -104 |
| SS-RSRP Note 3 | | dBm/15 kHz | -87 |
| Ês/Iot | | dB | 17 |
| Ês/Noc | | dB | 17 |
| IoNote3 | Config 1,2,4,5 | dBm/  9.36MHz | -58.96 |
| Config 3,6 | dBm/  38.16MHz | -52.86 |
| Time offset to Cell1 Note 4 | | μs | 33 |
| 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 modeled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselvess.  Note 4: Receive time difference of signals received between subframe timing boundary of E-UTRA PCell and slot timing boundary of PSCell at the UE antenna connector including time alignment error between the two cells | | | |

A.4.5.2.5.2 Test Requirements

The UE shall be continuously scheduled in LTE PCell and NR PSCell during the entire length of T1. During the time duration T1 the UE shall transmit at least 99.5% of ACK/NACK on NR PSCell. The UE is only allowed to cause interruptions immediately before and immediately after an SMTC. Each interruption on NR PSCell shall not exceed X defined in Table A.4.5.2.5.2-1 if the NR PSCell is not in the same band as the E-UTRAN deactivated SCell or Y in Table A.4.5.2.3.2-1 if the NR PSCell is in the same band as the E-UTRAN deactivated SCell.

**Table A.4.5.2.5.2-1: Interruption length X and Y at measurements on deactivated E-UTRA SCC**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length X slot** | **Interruption length Y slot** |
| **Sync** |
| 0 | 1 | 1 | 1 |
| 1 | 0.5 | 1 | 1 |

Each interruption on E-UTRAN PCell shall not exceed 1 subframe if the PCell is not in the same band as the deactivated SCell, or 5 subframes if the PCell is in the same band as the deactivated SCell.

The rate of correct events observed during repeated tests shall be at least 90%.

A.4.5.2.6 E-UTRAN – NR FR1 interruptions during measurements on deactivated E-UTRAN SCC in asynchronous EN-DC

A.4.5.2.6.1 Test Purpose and Environment

The purpose of this test is to verify E-UTRAN PCell and NR PSCell interruptions during the measurement on the deactivated NR SCC, the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for E-UTRAN PCell and NR PSCell in EN-DC specified in TS 38.133 section 8.2.1. Supported test configurations are shown in table A.4.5.2.6.1-1.

The general test parameters and NR cell specific test parameters are given in Table A.4.5.2.6.1-1 and A.4.5.2.6.1-2 below. And the E-UTRAN cell specific test parameters can refer to Table A.3.7.2.1-1. In the test there are three cells: Cell1, Cell2 and Cell3. Cell1 and Cell3 is E-UTRAN PCell and E-UTRAN deactivated SCell, Cell2 is NR FR1 PSCell. Cell1 shall be configured as LTE PCell and Cell2 shall be configured as NR PSCell. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE is connected to Cell1 and Cell2. The point in time at which the RRC message including *measCycleSCell* or *allowInterruptions* for the deactivated NR SCells is received at the UE antenna connector, defines the start of time period T1. During T1, LTE PCell and NR PSCell are continuously scheduled in DL.

**Table A.4.5.2.6.1-1: Interruptions during measurements on deactivated E-UTRAN SCC supported test configurations**

|  |  |
| --- | --- |
| **Config** | **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.4.5.2.6.1-2: General test parameters for E-UTRAN – NR interruptions during measurements on deactivated E-UTRAN SCC in asynchronous EN-DC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1, 2, 3 | One is NR RF channel and the other two are E-UTRAN RF channels |
| Active PCell |  | Cell1 | PCell on E-UTRAN RF channel number 1. |
| Configured PSCell |  | Cell2 | PSCell on NR RF channel number 2. |
| Configured deactivated SCell |  | Cell3 | Deactivated SCell on E-UTRAN RF channel number 3. |
| CP length |  | Normal | Applicable to Cell1, Cell2 and Cell3 |
| DRX |  | OFF |  |
| Measurement gap pattern Id |  | OFF |  |
| SCell measurement cycle (measCycleSCell) | ms | 640 |  |
| T1 | s | 10 |  |

**Table A.4.5.2.6.1-3: NR cell specific test parameters for E-UTRAN – NR interruptions during measurements on deactivated E-UTRAN SCC in asynchronous EN-DC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Cell2** |
| Frequency Range | |  | FR1 |
| 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 |  | 10: NRB,c = 52 |
| Config 2,5 | 10: NRB,c = 52 |
| Config 3,6 | 40: NRB,c = 106 |
| Initial DL BWP Configuration | Config 1,4 |  | DLBWP.0.1 |
| Config 2,5 | DLBWP.0.1 |
| Config 3,6 | DLBWP.0.1 |
| Dedicated DL BWP Configuration | Config 1,4 |  | DLBWP.1.1 |
| Config 2,5 | DLBWP.1.1 |
| Config 3,6 | DLBWP.1.1 |
| Initial UL BWP Configuration | Config 1,4 |  | ULBWP.0.1 |
| Config 2,5 | ULBWP.0.1 |
| Config 3,6 | ULBWP.0.1 |
| Dedicated UL BWP Configuration | Config 1,4 |  | ULBWP.1.1 |
| Config 2,5 | ULBWP.1.1 |
| Config 3,6 | ULBWP.1.1 |
| PDSCH Reference measurement channel | Config 1,4 |  | SR.1.1 FDD |
| Config 2,5 | SR.1.1 TDD |
| Config 3,6 | SR.2.1 TDD |
| RMSI CORESET parameters | Config 1,4 |  | CR.1.1 FDD |
| Config 2,5 | CR.1.1 TDD |
| Config 3,6 | CR.2.1 TDD |
| PDCCH CORESET parameters | Config 1,4 |  | CCR.1.1 FDD |
| Config 2,5 | CCR.1.1 TDD |
| Config 3,6 | CCR.2.1 TDD |
| TRS configuration | Config 1,4 |  | TRS.1.1 FDD |
| Config 2,5 | TRS.1.1 TDD |
| Config 3,6 | TRS.1.2 TDD |
| OCNG Patterns | |  | OP.1 |
| SMTC Configuration | |  | SMTC.1 |
| TCI state | |  | TCI.State.0 |
| SSB Configuration | Config 1,2,4,5 |  | SSB.1 FR1 |
| Config 3,6 | SSB.2 FR1 |
| Correlation Matrix and Antenna Configuration | |  | 1x2 Low |
| 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) | |
| NocNote 2 | | dBm/15 kHz | -104 |
| SS-RSRP Note 3 | | dBm/15 kHz | -87 |
| Ês/Iot | | dB | 17 |
| Ês/Noc | | dB | 17 |
| IoNote3 | Config 1,2,4,5 | dBm/  9.36MHz | -58.96 |
| Config 3,6 | dBm/  38.16MHz | -52.86 |
| Time offset to Cell1 Note 4 | | μs | 500 |
| 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 modeled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselvess.  Note 4: Receive time difference of signals received between subframe timing boundary of E-UTRA PCell and slot timing boundary of PSCell at the UE antenna connector including time alignment error between the two cells | | | |

A.4.5.2.6.2 Test Requirements

The UE shall be continuously scheduled in LTE PCell and NR PSCell during the entire length of T1. During the time duration T1 the UE shall transmit at least 99.5% of ACK/NACK on E-UTRAN PCell and NR PSCell. The UE is only allowed to cause interruptions immediately before and immediately after an SMTC. Each interruption on NR PSCell shall not exceed the value defined in Table A.4.5.2.4.2-1 and Table A.4.5.2.4.2-2.

**Table A.4.5.2.6.2-1: Interruption duration if the NR PSCell is not in the same band as the E-UTRAN deactivated SCell**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length** |
| 0 | 1 | 2 |
| 1 | 0.5 | 2 |

**Table A.4.5.2.6.2-2: Interruption duration if the NR PSCell is in the same band as the E-UTRAN deactivated SCell**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length** |
| 0 | 1 | 2 + SMTC duration |
| 1 | 0.5 | 2 + SMTC duration |

Each interruption on E-UTRAN PCell shall not exceed 1 subframe if the PCell is not in the same band as the deactivated SCell, or 5 subframes if the PCell is in the same band as the deactivated SCell.

The rate of correct events observed during repeated tests shall be at least 90%.

**<End of modified section 1>**

**<Start of modified section 2>**

#### A.5.5.2.3 E-UTRAN – NR FR2 interruptions during measurements on deactivated NR SCC in synchronous EN-DC

##### A.5.5.2.3.1 Test Purpose and Environment

The purpose of this test is to verify E-UTRAN PCell and NR PSCell interruptions during the measurement on the deactivated NR SCC, the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for E-UTRAN PCell and NR PSCell in EN-DC specified in clause 8. 2.1.2. Supported test configurations are shown in table A.5.5.2.3.1-1.

The general test parameters are given in Table A.5.5.2.3.1-2, and NR cell specific test parameters are given in Table A.5.5.2.3.1-3 and A.5.5.2.3.1-4 below. And the E-UTRAN cell specific test parameters can refer to Table A.3.7.2.1-2. In the test there are three cells: Cell1 Cell2 and Cell3. Cell1 is LTE PCell, Cell2 and Cell 3 is NR FR2 PSCell and NR FR2 deactivated SCell. Cell1 shall be configured as LTE PCell and Cell2 shall be configured as NR PSCell. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE is connected to Cell1 and Cell2. The point in time at which the RRC message including *measCycleSCell* for the deactivated NR SCells is received by the UE, defines the start of time period T1. During T1, LTE PCell and NR PSCell are continuously scheduled in DL.

Table A.5.5.2.3.1-1: Interruption during measurements on deactivated NR SCC supported test configurations

|  |  |
| --- | --- |
| Config | Description |
| 1 | LTE FDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 2 | LTE TDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Table A.5.5.2.3.1-2: General test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated NR SCC in synchronous EN-DC

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| RF Channel Number |  | 1, 2, 3 | One is E-UTRAN RF channel and the other two are NR RF channels |
| Active PCell |  | Cell1 | PCell on E-UTRAN RF channel number 1. |
| Configured PSCell |  | Cell2 | PSCell on NR RF channel number 2. |
| Configured deactivated SCell |  | Cell3 | Deactivated SCell on NR RF channel number 3. |
| CP length |  | Normal | Applicable to cell1, cell 2 and cell3 |
| DRX |  | OFF |  |
| Measurement gap pattern Id |  | OFF |  |
| SCell measurement cycle (measCycleSCell) | Ms | 640 |  |
| T1 | S | 10 |  |

Table A.5.5.2.3.1-3: NR cell specific test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated NR SCC in synchronous EN-DC

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | Cell 3 |
| Frequency Range | |  | FR2 | FR2 |
|  |  |  |  |  |
|  |  |  |
| Duplex mode | Config 1,2 |  | TDD | TDD |
|  |  |  |  |  |
|  |  |  |
| TDD configuration | Config 1,2 |  | TDDConf.3.1 | TDDConf.3.1 |
| BWchannel | Config 1,2 | MHz | 100: NRB,c = 66 | 100: NRB,c = 66 |
| Downlink initial BWP Configuration | Config 1,2 |  | DLBWP.0.1 | DLBWP.0.1 |
| Downlink dedicated BWP Configuration | Config 1,2 |  | DLBWP.1.1 | DLBWP.1.1 |
| Uplink initial BWP configuration | Config 1,2 |  | ULBWP.0.1 | ULBWP.0.1 |
| Uplink dedicated BWP configuration | Config 1,2 |  | ULBWP.1.1 | ULBWP.1.1 |
| PDSCH Reference measurement channel | Config 1,2 |  | SR.3.1 TDD | - |
| RMSI CORESET Reference Channel | Config 1,2 |  | CR.3.1 TDD | CR.3.1 TDD |
| PDCCH CORESET parameters | Config 1,2 |  | CCR 3.1 TDD | CCR 3.1 TDD |
| OCNG Patterns | |  | OP.1 | OP.1 |
| SSB Configuration | Config 1,2 |  | SSB.1 FR2 | SSB.1 FR2 |
| SMTC Configuration | Config 1,2 |  | SMTC.1 | SMTC.1 |
| TRS configuration | Config 1,2 |  | TRS.2.1 TDD | TRS.2.1 TDD |
| TCI state | Config 1,2 |  | TCI.State.0 | TCI.State.0 |
| EPRE ratio of PSS to SSS | | dB | 0 | 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 | |  | AWGN | AWGN |
| Time offset to cell1 Note 2 | | μs | 3 | 3 |
| Time offset to cell1 Note 3 | | μs | - | 3 |
| 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: Receive time difference of signals received between subframe timing boundary of E-UTRA PCell and slot timing boundary of PSCell including time alignment error between the two cells  Note 3: Receive time difference of signals received between slot timing boundary from two NR Cells including time alignment error between the two cells | | | | |

Table A.5.5.2.3.1-4: NR cell specific OTA related test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated NR SCC in synchronous EN-DC

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Cell 2** | **Cell 3** |
| Angle of arrival configuration | |  | Setup 1 defined in clause A.3.15.1 | Setup 1 defined in clause A.3.15.1 |
| Note1 | NR\_TDD\_FR2\_A | dBm/15kHz | -112 | -105 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
| Note1 | NR\_TDD\_FR2\_A | dBm/SCSNote3 | -103 | -96 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
| SS-RSRPNote2 | NR\_TDD\_FR2\_A | dBm/SCS Note4 | -86 | -86 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
|  | NR\_TDD\_FR2\_A | dB | 17 | 10 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
| Ês/Noc | NR\_TDD\_FR2\_A | dB | 17 | 10 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
| IoNote2 | NR\_TDD\_FR2\_A | dBm/95.04 MHz Note4 | -59.4 | -59.4 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
| Note 1: 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 2: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone  Note 5: As observed with 0dBi gain antenna at the centre of the quiet zone | | | | |

##### A.5.5.2.3.2 Test Requirements

The UE shall be continuously scheduled in LTE PCell and NR PSCell during the entire length of T1. During the time duration T1 the UE shall transmit at least 99.5% of ACK/NACK on NR PSCell. The UE is only allowed to cause interruptions immediately before and immediately after an SMTC. Each interruption on NR PSCell shall not exceed the value defined in Table A.5.5.2.3.2-1 and Table A.5.5.2.3.2-2.

Table A.5.5.2.3.2-1: Interruption duration if the NR PSCell is not in the same band as the deactivated SCell

|  |  |  |
| --- | --- | --- |
|  | NR Slot length (ms) | Interruption length  (slot) |
| 3 | 0.125 | 4 |

Table A.5.5.2.3.2-2: Interruption duration if the NR PSCell is not in the same band as the deactivated SCell

|  |  |  |
| --- | --- | --- |
|  | NR Slot length (ms) | Interruption length  (slot) |
| 3 | 0.125 | 4 + SMTC duration |

Each interruption on E-UTRAN PCell shall not exceed 1 subframe for synchronous interband EN-DC.

Each interruption on E-UTRAN PCell shall not exceed 1 subframe.

The rate of correct events observed during repeated tests shall be at least 90%.

#### A.5.5.2.4 E-UTRAN – NR FR2 interruptions during measurements on deactivated NR SCC in asynchronous EN-DC

##### A.5.5.2.4.1 Test Purpose and Environment

The purpose of this test is to verify E-UTRAN PCell and NR PSCell interruptions during the measurement on the deactivated NR SCC, the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for E-UTRAN PCell and NR PSCell in EN-DC specified in clause 8. 2.1.2. Supported test configurations are shown in table A.5.5.2.4.1-1.

The general test parameters are given in Table A.5.5.2.4.1-2, and NR cell specific test parameters are given in Table A.5.5.2.4.1-3 and A.5.5.2.4.1-4 below. And the E-UTRAN cell specific test parameters can refer to Table A.3.7.2.1-2. In the test there are three cells: Cell1 Cell2 and Cell3. Cell1 is LTE PCell, Cell2 and Cell 3 is NR FR2 PSCell and NR FR2 deactivated SCell. Cell1 shall be configured as LTE PCell and Cell2 shall be configured as NR PSCell. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE is connected to Cell1 and Cell2. The point in time at which the RRC message including *measCycleSCell* for the deactivated NR SCells is received by the UE, defines the start of time period T1. During T1, LTE PCell and NR PSCell are continuously scheduled in DL.

Table A.5.5.2.4.1-1: Interruption during measurements on deactivated NR SCC supported test configurations

|  |  |
| --- | --- |
| Config | Description |
| 1 | LTE FDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 2 | LTE TDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Table A.5.5.2.4.1-2: General test parameters for E-UTRAN – NR interruptions during measurements on deactivated NR SCC in asynchronous EN-DC

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| RF Channel Number |  | 1, 2, 3 | One is E-UTRAN RF channel and the other two are NR RF channels |
| Active PCell |  | Cell1 | PCell on E-UTRAN RF channel number 1. |
| Configured PSCell |  | Cell2 | PSCell on NR RF channel number 2. |
| Configured deactivated SCell |  | Cell3 | Deactivated SCell on NR RF channel number 3. |
| CP length |  | Normal | Applicable to cell1, cell 2 and cell3 |
| AoA number |  | 1 | Applicable to cell2 and cell3 |
| DRX |  | OFF |  |
| Measurement gap pattern Id |  | OFF |  |
| SCell measurement cycle (measCycleSCell) | ms | 640 |  |
| T1 | s | 10 |  |

Table A.5.5.2.3.1-3: NR cell specific test parameters for E-UTRAN – NR interruptions during measurements on deactivated NR SCC in asynchronous EN-DC

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 | Cell 3 |
| Frequency Range | |  | FR2 | FR2 |
|  |  |  |  |  |
|  |  |  |
| Duplex mode | Config 1,2 |  | TDD | TDD |
|  |  |  |  |  |
|  |  |  |
| TDD configuration | Config 1,2 |  | TDDConf.3.1 | TDDConf.3.1 |
| BWchannel | Config 1,2 | MHz | 100: NRB,c = 66 | 100: NRB,c = 66 |
| Downlink initial BWP Configuration | Config 1,2 |  | DLBWP.0.1 | |
| Downlink dedicated BWP Configuration | Config 1,2 |  | DLBWP.1.1 | |
| Uplink initial BWP configuration | Config 1,2 |  | ULBWP.0.1 | |
| Uplink dedicated BWP configuration | Config 1,2 |  | ULBWP.1.1 | |
| PDSCH Reference measurement channel | Config 1,2 |  | SR.3.1 TDD | - |
| RMSI CORESET Reference Channel | Config 1,2 |  | CR.3.1 TDD | CR.3.1 TDD |
| PDCCH CORESET parameters | Config 1,2 |  | CCR.3.1 TDD | CCR.3.1 TDD |
| OCNG Patterns | |  | OP.1 | OP.1 |
| SSB Configuration |  |  | SSB.1 FR2 | SSB.1 FR2 |
| SMTC Configuration | Config 1,2 |  | SMTC.1 FR2 | SMTC.1 FR2 |
| TRS configuration | Config 1,2 |  | TRS.2.1 TDD | TRS.2.1 TDD |
| TCI state | Config 1,2 |  | TCI.State.0 | TCI.State.0 |
| EPRE ratio of PSS to SSS | | dB | 0 | 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 | |  | AWGN | AWGN |
| Time offset to cell1 Note 2 | | ms | 3 | 3 |
| Time offset to cell1 Note 3 | | μs | - | 3 |
| 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: Receive time difference of signals received between subframe timing boundary of E-UTRA PCell and slot timing boundary of PSCell including time alignment error between the two cells  Note 3: Receive time difference of signals received between slot timing boundary from two NR Cells including time alignment error between the two cells | | | | |

Table A.5.5.2.4.1-4: NR cell specific OTA related test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated NR SCC in asynchronous EN-DC

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Cell 2** | **Cell 3** |
| Angle of arrival configuration | |  | Setup 1 defined in clause A.3.15.1 | Setup 1 defined in clause A.3.15.1 |
| Note1 | NR\_TDD\_FR2\_A | dBm/15kHz | -112 | -105 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
| Note1 | NR\_TDD\_FR2\_A | dBm/SCSNote3 | -103 | -96 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
| SS-RSRPNote2 | NR\_TDD\_FR2\_A | dBm/SCS Note4 | -86 | -86 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
|  | | dB | 17 | 10 |
| Ês/Noc | | dB | 17 | 10 |
| IoNote2 | NR\_TDD\_FR2\_A | dBm/95.04 MHz Note4 | -59.4 | -59.4 |
| NR\_TDD\_FR2\_B |
| NR\_TDD\_FR2\_F |
| NR\_TDD\_FR2\_G |
| NR\_TDD\_FR2\_T |
| NR\_TDD\_FR2\_Y |
| Note 1: 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 2: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone  Note 5: As observed with 0dBi gain antenna at the centre of the quiet zone | | | | |

##### A.5.5.2.4.2 Test Requirements

The UE shall be continuously scheduled in LTE PCell and NR PSCell during the entire length of T1. During the time duration T1 the UE shall transmit at least 99.5% of ACK/NACK on NR PSCell. The UE is only allowed to cause interruptions immediately before and immediately after an SMTC. Each interruption on NR PSCell shall not exceed the value defined in Table A.5.5.2.4.2-1 and Table A.5.5.2.4.2-2.

Table A.5.5.2.4.2-1: Interruption duration if the NR PSCell is not in the same band as the deactivated SCell

|  |  |  |
| --- | --- | --- |
|  | NR Slot length (ms) | Interruption length  (slot) |
| 3 | 0.125 | 4 |

Table A.5.5.2.4.2-2: Interruption duration if the NR PSCell is not in the same band as the deactivated SCell

|  |  |  |
| --- | --- | --- |
|  | NR Slot length (ms) | Interruption length  (slot) |
| 3 | 0.125 | 4 + SMTC duration |

Each interruption on E-UTRAN PCell shall not exceed 1 subframe.

The rate of correct events observed during repeated tests shall be at least 90%.

#### A.5.5.2.5 E-UTRAN – NR FR2 interruptions during measurements on deactivated E-UTRAN SCC in synchronous EN-DC

##### A.5.5.2.5.1 Test Purpose and Environment

The purpose of this test is to verify E-UTRAN PCell and NR PSCell interruptions during the measurement on the deactivated E-UTRAN SCC, the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for E-UTRAN PCell and NR PSCell in EN-DC specified in clause 8. 2.1.2. Supported test configurations are shown in table A.5.5.2.5.1-1.

The general test parameters are given in Table A.5.5.2.5.1-2, and NR cell specific test parameters are given in Table A.5.5.2.5.1-3 and A.5.5.2.5.1-4 below. And the E-UTRAN cell specific test parameters can refer to Table A.3.7.2.1-2. In the test there are three cells: Cell1 Cell2 and Cell3. Cell1 and Cell3 is LTE PCell and LTE deactivated SCell, Cell2 is NR FR2 PSCell. Cell1 shall be configured as LTE PCell and Cell2 shall be configured as NR PSCell. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE is connected to Cell1 and Cell2. The point in time at which the RRC message including *measCycleSCell* or *allowInterruptions* for the deactivated E-UTRA SCell is received by the UE, defines the start of time period T1. During T1, LTE PCell and NR PSCell are continuously scheduled in DL.

Table A.5.5.2.5.1-1: Interruption during measurements on deactivated E-UTRAN SCC supported test configurations

|  |  |
| --- | --- |
| Config | Description |
| 1 | LTE FDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 2 | LTE TDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Table A.5.5.2.5.1-2: General test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated E-UTRAN SCC in synchronous EN-DC

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| RF Channel Number |  | 1, 2, 3 | One is NR RF channel and two are E-UTRAN RF channels |
| Active PCell |  | Cell1 | PCell on E-UTRAN RF channel number 1. |
| Configured PSCell |  | Cell2 | PSCell on NR RF channel number 2. |
| Configured deactivated SCell |  | Cell3 | Deactivated SCell on E-UTRAN RF channel number 3. |
| CP length |  | Normal | Applicable to cell1, cell 2 and cell3 |
| DRX |  | OFF |  |
| Measurement gap pattern Id |  | OFF |  |
| SCell measurement cycle (measCycleSCell) | ms | 640 |  |
| T1 | s | 10 |  |

Table A.5.5.2.5.1-3: NR cell specific test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated E\_UTRAN SCC in synchronous EN-DC

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 |
| Frequency Range | |  | FR2 |
| Duplex mode | Config 1,2 |  | TDD |
| TDD configuration | Config 1,2 |  | TDDConf.3.1 |
| BWchannel | Config 1,2 | MHz | 100: NRB,c = 66 |
| Downlink initial BWP Configuration | Config 1,2 |  | DLBWP.0.1 |
| Downlink dedicated BWP Configuration | Config 1,2 |  | DLBWP.1.1 |
| Uplink initial BWP configuration | Config 1,2 |  | ULBWP.0.1 |
| Uplink dedicated BWP configuration | Config 1,2 |  | ULBWP.1.1 |
| PDSCH Reference measurement channel | Config 1,2 |  | SR.3.1 TDD |
| RMSI CORESET Reference Channel | Config 1,2 |  | CR.3.1 TDD |
| PDCCH CORESET parameters | Config 1,2 |  | CCR.3.1 TDD |
| OCNG Patterns | |  | OP.1 |
| SMTC Configuration | Config 1,2 |  | SMTC.1 FR2 |
| SSB Configuration | Config 1,2 |  | SSB.1 FR2 |
| TRS configuration | Config 1,2 |  | TRS.2.1 TDD |
| TCI state | Config 1,2 |  | TCI.State.0 |
| 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) | |
| Propagation Condition | |  | AWGN |
| Time offset to cell1 Note 2 | | μs | 3 |
| 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: Receive time difference of signals received between subframe timing boundary of E-UTRA PCell and slot timing boundary of PSCell including time alignment error between the two cells | | | |

Table A.5.5.2.5.1-4: NR cell specific OTA related test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated E\_UTRAN SCC in synchronous EN-DC

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell2 |
| Angle of arrival configuration |  | Setup 1 according to clause A.3.15.1 |
| Note1 | dBm/15kHzNote4 | -112 |
| Note1 | dBm/SCSNote3 | -102.97 |
|  | dB | 17 |
| SS-RSRPNote2 | dBm/SCS Note4 | -85.97 |
|  | dB | 17 |
| IoNote2 | dBm/95.04 MHz Note4 | -56.90 |
| Note 1: 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 2: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone  Note 5: As observed with 0dBi gain antenna at the centre of the quiet zone | | |

##### A.5.5.2.5.2 Test Requirements

The UE shall be continuously scheduled in LTE PCell and NR PSCell during the entire length of T1. During the time duration T1 the UE shall transmit at least 99.5% of ACK/NACK on NR PSCell. The UE is only allowed to cause interruptions immediately before and immediately after an SMTC. Each interruption on NR PSCell shall not exceed the value defined in Table A.5.5.2.5.2-1.

Table A.5.5.2.5.2-1: Interruption duration if the NR PSCell is not in the same band as the deactivated SCell

|  |  |  |
| --- | --- | --- |
|  | NR Slot length (ms) | Interruption length  (slot) |
| 3 | 0.125 | 5 |

Table A.5.5.2.5.2-2: Void



Each interruption on E-UTRAN PCell shall not exceed 1 subframe if the PCell is not in the same band as the deactivated SCell, or 5 subframes if the PCell is in the same band as the deactivated SCell.

Each interruption on E-UTRAN PCell shall not exceed 1 subframe.

The rate of correct events observed during repeated tests shall be at least 90%.

#### A.5.5.2.6 E-UTRAN – NR FR2 interruptions during measurements on deactivated E-UTRAN SCC in asynchronous EN-DC

##### A.5.5.2.6.1 Test Purpose and Environment

The purpose of this test is to verify E-UTRAN PCell and NR PSCell interruptions during the measurement on the deactivated E-UTRAN SCC, the UE missed ACK/NACK does not exceed the limits. This test will verify the missed ACK/NACK rate for E-UTRAN PCell and NR PSCell in EN-DC specified in clause 8. 2.1.2. Supported test configurations are shown in table A.5.5.2.6.1-1.

The general test parameters are given in Table A.5.5.2.6.1-2, and NR cell specific test parameters are given in Table A.5.5.2.6.1-3 and A.5.5.2.6.1-4 below. And the E-UTRAN cell specific test parameters can refer to Table A.3.7.2.1-2. In the test there are three cells: Cell1 Cell2 and Cell3. Cell1 and Cell3 is LTE PCell and LTE deactivated SCell, Cell2 is NR FR2 PSCell. Cell1 shall be configured as LTE PCell and Cell2 shall be configured as NR PSCell. The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE is connected to Cell1 and Cell2. The point in time at which the RRC message including *measCycleSCell* or *allowInterruptions* for the deactivated E-UTRA SCell is received by the UE, defines the start of time period T1. During T1, LTE PCell and NR PSCell are continuously scheduled in DL.

Table A.5.5.2.6.1-1: Interruption during measurements on deactivated E-UTRAN SCC supported test configurations

|  |  |
| --- | --- |
| Config | Description |
| 1 | LTE FDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 2 | LTE TDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Table A.5.5.2.6.1-2: General test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated E\_UTRAN SCC in asynchronous EN-DC

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| RF Channel Number |  | 1, 2, 3 | One is NR RF channel and two are E-UTRAN RF channels |
| Active PCell |  | Cell1 | PCell on E-UTRAN RF channel number 1. |
| Configured PSCell |  | Cell2 | PSCell on NR RF channel number 2. |
| Configured deactivated SCell |  | Cell3 | Deactivated SCell on E-UTRAN RF channel number 3. |
| CP length |  | Normal | Applicable to cell1, cell 2 and cell3 |
| DRX |  | OFF |  |
| Measurement gap pattern Id |  | OFF |  |
| SCell measurement cycle (measCycleSCell) | ms | 640 |  |
| T1 | s | 10 |  |

Table A.5.5.2.6.1-3: NR cell specific test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated E\_UTRAN SCC in asynchronous EN-DC

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Cell 2 |
| Frequency Range | |  | FR2 |
| Duplex mode | Config 1,2 |  | TDD |
| TDD configuration | Config 1,2 |  | TDDConf.3.1 |
| BWchannel | Config 1,2 | MHz | 100: NRB,c = 66 |
| Downlink initial BWP Configuration | Config 1,2 |  | DLBWP.0.1 |
| Downlink dedicated BWP Configuration | Config 1,2 |  | DLBWP.1.1 |
| Uplink initial BWP configuration | Config 1,2 |  | ULBWP.0.1 |
| Uplink dedicated BWP configuration | Config 1,2 |  | ULBWP.1.1 |
| PDSCH Reference measurement channel | Config 1,2 |  | SR.3.1 TDD |
| RMSI CORESET Reference Channel | Config 1,2 |  | CR.3.1 TDD |
| PDCCH CORESET parameters | Config 1,2 |  | CCR.3.1 TDD |
| OCNG Patterns | |  | OP.1 |
| SMTC Configuration | Config 1,2 |  | SMTC.1 FR2 |
| SSB Configuration | Config 1,2 |  | SSB.1 FR2 |
| TRS configuration | Config 1,2 |  | TRS.2.1 TDD |
| TCI state | Config 1,2 |  | TCI.State.0 |
| 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) | |
| Propagation Condition | |  | AWGN |
| Time offset to cell1 Note 2 | | ms | 3 |
| 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: Receive time difference of signals received between subframe timing boundary of E-UTRA PCell and slot timing boundary of PSCell including time alignment error between the two cells | | | |

Table A.5.5.2.6.1-4: NR cell specific OTA related test parameters for E-UTRAN – NR FR2 interruptions during measurements on deactivated E\_UTRAN SCC in asynchronous EN-DC

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell2 |
| Angle of arrival configuration |  | According to clause A.3.15.1 |
| Note1 | dBm/15kHzNote4 | -112 |
| Note1 | dBm/SCSNote3 | -102.97 |
|  | dB | 17 |
| SS-RSRPNote2 | dBm/SCS Note4 | -85.97 |
|  | dB | 17 |
| IoNote2 | dBm/95.04 MHz Note4 | -56.90 |
| Note 1: 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 2: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone  Note 5: As observed with 0dBi gain antenna at the centre of the quiet zone | | |

##### A.5.5.2.6.2 Test Requirements

The UE shall be continuously scheduled in LTE PCell and NR PSCell during the entire length of T1. During the time duration T1 the UE shall transmit at least 99.5% of ACK/NACK on NR PSCell. The UE is only allowed to cause interruptions immediately before and immediately after an SMTC. Each interruption on NR PSCell shall not exceed the value defined in Table A.5.5.2.6.2-1.

Table A.5.5.2.6.2-1: Interruption duration if the NR PSCell is not in the same band as the deactivated SCell

|  |  |  |
| --- | --- | --- |
|  | NR Slot length (ms) | Interruption length  (slot) |
| 3 | 0.125 | 5 |

Table A.5.5.2.6.2-2: Void



Each interruption on E-UTRAN PCell shall not exceed 1 subframe if the PCell is not in the same band as the deactivated SCell, or 5 subframes if the PCell is in the same band as the deactivated SCell.

Each interruption on E-UTRAN PCell shall not exceed 1 subframe.

The rate of correct events observed during repeated tests shall be at least 90%.

**<End of modified section 2>**

**<Start of modified section 3>**

A.6.5.2 Interruption

A.6.5.2.1 Interruptions during measurements on deactivated NR SCC in FR1

A.6.5.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE missed ACK/NACK rate does not exceed the limits at NR PSCell interruptions during the measurement on the deactivated NR SCC. This test will verify the missed ACK/NACK rate for PCell in standalone NR specified in clause 8.2.2.2. Supported test configurations are shown in table A.6.5.2.1.1-1.

The general test parameters and NR cell specific test parameters are given in Table A.6.5.2.1.1-2 and A 6.5.2.1.1-3 below. In the test there are two cells: Cell1 and Cell2. Cell1 is PCell, Cell2 is an NR deactivated SCell. Cell1 shall be configured as PCell and Cell2 shall be configured as SCell.

The test consists of one time period, with duration of T1. Prior to the start of the time duration T1, the UE is connected to Cell1 and Cell2. The point in time at which the RRC message including *measCycleSCell* or *allowInterruptions* for the deactivated NR SCells is received at the UE antenna connector defines the start of time period T1. During T1, PCell is continuously scheduled in DL.

**Table A.6.5.2.1.1-1: Interruptions during measurements on deactivated NR SCC supported test configurations**

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

**Table A.6.5.2.1.1-2: General test parameters for interruptions during measurements on deactivated NR SCC in standalone NR**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1, 2 | Two NR RF channels |
| Active PCell |  | Cell1 | PCell on NR RF channel number 1. |
| Configured deactivated SCell |  | Cell2 | Deactivated SCell on NR RF channel number 2. |
| CP length |  | Normal | Applicable to Cell1 and Cell2 |
| DRX |  | OFF |  |
| Measurement gap pattern Id |  | OFF |  |
| SCell measurement cycle (measCycleSCell) | ms | 640 |  |
| T1 | s | 10 |  |

**Table A.6.5.2.1.1-3: NR cell specific test parameters for interruptions during measurements on deactivated NR SCC in standalone NR**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Cell1** | **Cell2** |
| Frequency Range | |  | FR1 | FR1 |
| Duplex mode | Config 1 |  | FDD | FDD |
| Config 2,5 | TDD | TDD |
| Confiq 3 | TDD | FDD |
| Confiq 4 | FDD | TDD |
| TDD configuration | Config 1 |  | Not Applicable | Not Applicable |
| Config 2 | TDDConf.1.1 | TDDConf.1.1 |
| Config 3 | TDDConf.1.1 | Not Applicable |
| Confiq 4 | Not Applicable | TDDConf.1.1 |
| Confiq 5 | TDDConf.1.2 | TDDConf.1.2 |
| BWchannel | Config 1,2,3,4 |  | 10 MHz: NRB,c = 52 | 10 MHz: NRB,c = 52 |
| Config 5 | 40 MHz: NRB,c = 106 | 40 MHz: NRB,c = 106 |
| Initial BWP Configuration |  |  | DLBWP.0.2Note6 | |
| PDSCH Reference measurement channel | Config 1 |  | SR.1.1 FDD | SR.1.1 FDD |
| Config 2 | SR.1.1 TDD | SR.1.1 TDD |
| Config 3 | SR.1.1 TDD | SR.1.1 FDD |
| Confiq 4 | SR.1.1 FDD | SR.1.1 TDD |
| Confiq 5 | SR.2.1 TDD | SR.2.1 TDD |
| RMSI CORESET parameters | Config 1 |  | CR.1.1 FDD | CR.1.1 FDD |
| Config 2 | CR.1.1 TDD | CR.1.1 TDD |
| Config 3 | CR.1.1 TDD | CR.1.1 FDD |
| Confiq 4 | CR.1.1 FDD | CR.1.1 TDD |
| Confiq 5 | CR.2.1 TDD | CR.2.1 TDD |
| Dedicated CORESET parameters | Config 1 |  | CCR.1.1 FDD | CCR.1.1 FDD |
| Config 2 | CCR.1.1 TDD | CCR.1.1 TDD |
| Config 3 | CCR.1.1 TDD | CCR.1.1 FDD |
| Config 4 | CCR.1.1 FDD | CCR.1.1 TDD |
| Config 5 | CCR.2.1 TDD | CCR.2.1 TDD |
| OCNG Patterns | |  | OP.1 | OP.1 |
| SMTC Configuration | |  | SMTC.1 | SMTC.1 |
| SSB Configuration | Config 1,2,3,4 |  | SSB.1 FR1 | SSB.1 FR1 |
| Config 5 | SSB.2 FR1 | SSB.2 FR1 |
| Correlation Matrix and Antenna Configuration | |  | 1x2 Low | 1x2 Low |
| EPRE ratio of PSS to SSS | | dB | 0 | 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) | |
| NocNote 2 | | dBm/15 kHz | -104 | -104 |
| SS-RSRP Note 3 | | dBm/15 kHz | -87 | -87 |
| Ês/Iot | | dB | 17 | 17 |
| Ês/Noc | | dB | 17 | 17 |
| NocNote 2 | Config 1,2,3,4 | dBm/SCS | -104 | -104 |
| Config 5 | -101 | -101 |
| IoNote3 | Config 1,2,3,4 | dBm/  9.36MHz | -58.96 | -58.96 |
| Config 5 | dBm/  38.16MHz | -52.86 | -52.86 |
| Time offset to Cell1 Note 5 | | μs | - | 3 |
| Propagation Condition | |  | 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 modeled as AWGN of appropriate power for Noc to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselvess.  Note 4: Void  Note 5: Receive time difference between slot boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.  Note 6: For unpaired spectrum, a DL BWP is linked with an UL BWP. DLBWP.0.2 is linked with ULBWP.0.2 defined in clause 12 of TS 38.213 [3]. | | | | |

A.6.5.2.1.2 Test Requirements

The UE shall be continuously scheduled on PCell during the entire length of T1. During the time duration T1 the UE shall transmit at least 99.5% of ACK/NACK on PCell.

The UE is only allowed to cause interruptions immediately before and immediately after an SMTC. Each interruption on PCell shall not exceed the value defined in Table A.6.5.2.1.2-1 if the PCell is not in the same band as the deactivated SCell or Table A.6.5.2.1.2-2 if the PCell is in the same band as the deactivated SCell.

**Table A.6.5.2.1.2-1: Interruption duration if the PCell is not in the same band as the deactivated SCell**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length** |
| 0 | 1 | 1 |
| 1 | 0.5 | 1 |

**Table A.6.5.2.1.2-2: Interruption duration if the PCell is in the same band as the deactivated SCell**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length (ms)** | **Interruption length** |
| 0 | 1 | 1 + SMTC duration |
| 1 | 0.5 | 1 + SMTC duration |

The rate of correct events observed during repeated tests shall be at least 90%.

**<End of modified section 2>**