**3GPP TSG-RAN WG4 Meeting # 98-bis-e R4-2105727**

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

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **Draft** | **rev** |  | **Current version:** | **16.7.0** |  |
|  |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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|  |
| ***Title:***  | Draft CR on test cases for intra-frequency measurement accuracy for NR-U |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_unlic-Perf |  | ***Date:*** | 2021-03-01 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | The Draft CR is based on the endorsed CR R4-2103532. The new changes are using “additional changes for RAN4#98-bis-e”* Some configurations shall be added or updated according to the new configurations introduced for NR-U.
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|  |  |
| ***Summary of change:*** | * Add and update some configurations according to the agreements in RAN4#98e meeting.
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|  |  |
| ***Consequences if not approved:*** | The test cases are incomplete. |
|  |  |
| ***Clauses affected:*** | A.9.4.1.1, A.11.6.1.1 and A.11.6.1.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.533 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

### <Start of Change 1>

#### A.9.4.1.1 Intra-frequency measurement accuracy on a carrier frequency with CCA

##### A.9.4.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the SS-RSRP measurement accuracy on the carrier frequency with CCA is within the specified limits. This test will verify the requirements in clauses 10.1.27.1.1 and 10.1.27.1.2 for intra-frequency measurements under CCA.

##### A.9.4.1.1.2 Test parameters

Three cells are deployed in the test, which are FR1 PCell (Cell 1), and two cells on the same carrier frequency with CCA and transmit SSBs in DBT windows according to DL CCA model: SCell (Cell 2) and a neighbour cell (Cell 3). Supported test configurations are shown in table A.9.4.1.1.2-1. Both absolute and relative accuracy of SS-RSRP intra-frequency measurements are tested by using the parameters in A.9.4.1.1.2-2.

Table A.9.4.1.1.2-1: SS-RSRP Intra frequency SS-RSRP supported test configurations

|  |  |
| --- | --- |
| Config | Description |
| 1 | NR carrier with CCA: 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex modeNR carrier without CCA: 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NR carrier with CCA: 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex modeNR carrier without CCA: 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | NR carrier with CCA: 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex modeNR carrier without CCA: 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |

Table A.9.4.1.1.2-2: SS-RSRP Intra frequency test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 | Test 3 |
|  |  | Cell 2 | Cell 3 | Cell 2 | Cell 3 | Cell 2 | Cell 3 |
| Cell ID |  | 489 | 0 | 489 | 0 | 489 | 0 |
| SSB ARFCN |  | freq1 | freq1 | freq1 |
| DL CCA model |  | As specified in clause A.3.20.2.1 |
| UL CCA model |  | As specified in clause A.3.20.2.2 |
| PCCA\_DL |  | [TBD] |
| PCCA\_UL |  | [TBD] |
| TDD configuration | Config 1,2,3 |  | TDDConf.1.1 CCA |
| BWchannel | Config 1,2,3 | MHz | 40: NRB,c = 106 |
| BWP BW | Config 1,2,3 |  | 40: NRB,c = 106 |
| CCA model | Config 1,2,3 |  | TBD |
| Downlink initial BWP configuration |  | DLBWP.0.1 |
| Downlink dedicated BWP configuration |  | DLBWP.1.1 |
| Uplink initial BWP configuration |  | ULBWP.0.1 |
| Uplink dedicated BWP configuration |  | ULBWP.1.1 |
| TRS configuration | Config 1,2,3 |  | TRS.1.2 TDD | NA | TRS.1.2 TDD | NA | TRS.1.2 TDD | NA |
| DRX Cycle | ms | Not Applicable |
| PDSCH Reference measurement channel  | Config 1,2,3 |  | SR.1.1 CCA | - | SR.1.1 CCA | - | SR.1.1 CCA | - |
| RMSI CORESET Reference Channel | Config 1,2,3 |  | CR.1.1 CCA | - | CR.1.1 CCA | - | CR.1.1 CCA | - |
| Control channel RMC | Config 1,2,3 |  | CR.1.1 CCA | - | CR.1.1 CCA | - | CR.1.1 CCA | - |
| SSB configuration for semi-static channel access | Config 1,2,3 |  | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA |
| SSB configuration for dynamic channel access | Config 1,2,3 |  | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA |
| DBT window configuration | Config 1,2,3 |  | DBT.1 | DBT.1 | DBT.1 | DBT.1 | DBT.1 | DBT.1 |
| Time offset with Cell 1 | Config 1,2,3 | μs | - | 3 | - | 3 | - | 3 |
| SMTC configuration | Config 1,2,3 |  | SMTC.1 |
| OCNG Patterns |  | OCNG pattern 1 |
| PDSCH/PDCCH subcarrier spacing | Config 1,2,3 | kHz | 30 kHz |
| EPRE ratio of PSS to SSS | dB | 0 | 0 | 0 | 0 | 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) |  |  |  |  |  |  |  |
| Note2 | Config 1,2,3 | NR\_TDD\_FR1\_I |  | Not applicableNote 5 | -94 | TBD |
| Note2 | Config 1,2,3 | NR\_TDD\_FR1\_I | dBm/SCS | Not applicableNote 5 | -91 | TBD |
|  Note6 | dB | 2.46 | -5.97 | 2.46 | -5.97 | TBD | TBD |
|  Note6 | dB | 6 | 1 | 6 | 1 | TBD | TBD |
| SS-RSRPNote3,6 | Config 1,2,3 | NR\_TDD\_FR1\_I | dBm/SCS | Not applicableNote 5 | Not applicableNote 5 | -85 | -90 | TBD | TBD |
| IoNote3 | Config 1,2,3 | NR\_TDD\_FR1\_I | dBm/38.16MHz | Not applicableNote 5- | -51.99 | TBD |
| Propagation condition | - | AWGN |
| Antenna configuration |  | 1x2 |
| NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.NOTE 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.NOTE 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.NOTE 5: Subtest 1 is not used when testing with 30kHz SSB SCS.NOTE 6: The signal levels apply for SSS REs when the discovery burst is transmitted during DBT windows. |

##### A.9.4.1.1.3 Test Requirements

The SS-RSRP measurement accuracy for cell 2 and cell 3 shall fulfil absolute requirement in clause 10.1.27.1.1 and relative requirement in clause 10.1.27.1.2.

### <End of Change 1>

###  <Start of Change 2>

#### A.11.6.1.1 Intra-frequency measurement accuracy on a carrier frequency with CCA

##### A.11.6.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the SS-RSRP measurement accuracy on the carrier frequency with CCA is within the specified limits. This test will verify the requirements in clauses 10.1.27.1.1 and 10.1.27.1.2 for intra-frequency measurements under CCA.

##### A.11.6.1.1.2 Test parameters

In this set of test cases all cells are on the same carrier frequency with CCA and transmit SSBs in DBT windows according to DL CCA model. Supported test configurations are shown in table A.11.6.1.1.2-1. Both absolute and relative accuracy of SS-RSRP intra-frequency measurements are tested by using the parameters in A.11.6.1.1.2-2. In all test cases, Cell 1 is the PCell, and Cell 2 is the target cell.

Table A.11.6.1.1.2-1: SS-RSRP Intra frequency SS-RSRP supported test configurations

|  |  |
| --- | --- |
| Config | Description |
| 1 |  NR 30kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |

Table A.11.6.1.1.2-2: SS-RSRP Intra frequency test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 | Test 3 |
|  |  | Cell 1 | Cell 2 | Cell 1 | Cell 2 | Cell 1 | Cell 2 |
| Cell ID |  | 489 | 0 | 489 | 0 | 489 | 0 |
| SSB ARFCN |  | freq1 | freq1 | freq1 |
| TDD configuration | Config 1 |  | TDDConf.1.1 CCA |
| BWchannel | Config 1 | MHz | 40: NRB,c = 106 |
| BWP BW | Config 1 |  | 40: NRB,c = 106 |
| DL CCA model |  | As specified in clause A.3.20.2.1 |
| UL CCA model |  | As specified in clause A.3.20.2.2 |
| PCCA\_DL |  | [TBD] |
| PCCA\_UL |  | [TBD] |
| Downlink initial BWP configuration |  | DLBWP.0.1 |
| Downlink dedicated BWP configuration |  | DLBWP.1.1 |
| Uplink initial BWP configuration |  | ULBWP.0.1 |
| Uplink dedicated BWP configuration |  | ULBWP.1.1 |
| TRS configuration | Config 1 |  | TRS.1.2 TDD | NA | TRS.1.2 TDD | NA | TRS.1.2 TDD | NA |
| DRX Cycle | ms | Not Applicable |
| PDSCH Reference measurement channel  | Config 1 |  | SR.1.1 CCA | - | SR.1.1 CCA | - | SR.1.1 CCA | - |
| RMSI CORESET Reference Channel | Config 1 |  | CR.1.1 CCA | - | CR.1.1 CCA | - | CR.1.1 CCA | - |
| Control channel RMC | Config 1 |  | CR.1.1 CCA | - | CR.1.1 CCA | - | CR.1.1 CCA | - |
| SSB configuration for semi-static channel access | Config 1 |  | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA |
| SSB configuration for dynamic channel access | Config 1 |  | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA |
| DBT window configuration | Config 1,2,3 |  | DBT.1 | DBT.1 | DBT.1 | DBT.1 | DBT.1 | DBT.1 |
| Time offset with Cell 1 | Config 1 | μs | - | 3 | - | 3 | - | 3 |
| SMTC configuration | Config 1 |  | SMTC.1 |
| OCNG Patterns |  | OCNG pattern 1 |
| PDSCH/PDCCH subcarrier spacing | Config 1 | kHz | 30 kHz |
| EPRE ratio of PSS to SSS | dB | 0 | 0 | 0 | 0 | 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) |  |  |  |  |  |  |  |
| Note2 | Config 1 | NR\_TDD\_FR1\_I |  | Not applicableNote 5 | -94 | TBD |
| Note2 | Config 1 | NR\_TDD\_FR1\_I | dBm/SCS | Not applicableNote 5 | -91 | TBD |
|  Note6 | dB | 2.46 | -5.97 | 2.46 | -5.97 | TBD | TBD |
|  Note6 | dB | 6 | 1 | 6 | 1 | TBD | TBD |
| SS-RSRPNote3,6 | Config 1 | NR\_TDD\_FR1\_I | dBm/SCS | Not applicableNote 5 | Not applicableNote 5 | -85 | -90 | TBD | TBD |
| IoNote3 | Config 1 | NR\_TDD\_FR1\_I | dBm/38.16MHz | Not applicableNote 5- | -51.99 | TBD |
| Propagation condition | - | AWGN |
| Antenna configuration |  | 1x2 |
| NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.NOTE 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.NOTE 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.NOTE 5: Subtest 1 is not used when testing with 30kHz SSB SCS.NOTE 6: The signal levels apply for SSS REs when the discovery burst is transmitted during DBT windows. |

##### A.11.6.1.1.3 Test Requirements

The SS-RSRP measurement accuracy for cell 1 and cell 2 shall fulfil absolute requirement in clause 10.1.27.1.1 and relative requirement in clause 10.1.27.1.2.

#### A.11.6.1.2 Intra-frequency measurement accuracy on SCC on a carrier frequency with CCA

##### A.11.6.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SS-RSRP measurement accuracy on the carrier frequency with CCA is within the specified limits. This test will verify the requirements in clauses 10.1.27.1.1 and 10.1.27.1.2 for intra-frequency measurements under CCA.

##### A.11.6.1.2.2 Test parameters

Three cells are deployed in the test, which are FR1 PCell (Cell 1) on the carrier frequency with CCA, and two cells on the same carrier frequency with CCA and transmit SSBs in DBT windows according to DL CCA model: SCell (Cell 2) and a neighbour cell (Cell 3). Supported test configurations are shown in table A.11.6.1.2.2-1. Both absolute and relative accuracy of SS-RSRP intra-frequency measurements are tested by using the parameters in A.11.6.1.2.2-2.

Table A.11.6.1.2.2-1: SS-RSRP Intra frequency SS-RSRP supported test configurations

|  |  |
| --- | --- |
| Config | Description |
| 1 |  NR 30kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |

Table A.11.6.1.2.2-2: SS-RSRP Intra frequency test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 | Test 3 |
|  |  | Cell 2 | Cell 3 | Cell 2 | Cell 3 | Cell 2 | Cell 3 |
| Cell ID |  | 489 | 0 | 489 | 0 | 489 | 0 |
| SSB ARFCN |  | freq1 | freq1 | freq1 |
| TDD configuration | Config 1 |  | TDDConf.1.1 CCA |
| BWchannel | Config 1 | MHz | 40: NRB,c = 106 |
| BWP BW | Config 1 |  | 40: NRB,c = 106 |
| DL CCA model |  | As specified in clause A.3.20.2.1 |
| UL CCA model |  | As specified in clause A.3.20.2.2 |
| PCCA\_DL |  | [TBD] |
| PCCA\_UL |  | [TBD] |
| Downlink initial BWP configuration |  | DLBWP.0.1 |
| Downlink dedicated BWP configuration |  | DLBWP.1.1 |
| Uplink initial BWP configuration |  | ULBWP.0.1 |
| Uplink dedicated BWP configuration |  | ULBWP.1.1 |
| TRS configuration | Config 1 |  | TRS.1.2 TDD | NA | TRS.1.2 TDD | NA | TRS.1.2 TDD | NA |
| DRX Cycle | ms | Not Applicable |
| PDSCH Reference measurement channel  | Config 1 |  | SR.1.1 CCA | - | SR.1.1 CCA | - | SR.1.1 CCA | - |
| RMSI CORESET Reference Channel | Config 1 |  | CR.1.1 CCA | - | CR.1.1 CCA | - | CR.1.1 CCA | - |
| Control channel RMC | Config 1 |  | CR.1.1 CCA | - | CR.1.1 CCA | - | CR.1.1 CCA | - |
| SSB configuration for semi-static channel access | Config 1 |  | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA | SSB.1 CCA |
| SSB configuration for dynamic channel access | Config 1 |  | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA | SSB.2 CCA |
| DBT window configuration | Config 1,2,3 |  | DBT.1 | DBT.1 | DBT.1 | DBT.1 | DBT.1 | DBT.1 |
| Time offset with Cell 1 | Config 1 | μs | - | 3 | - | 3 | - | 3 |
| SMTC configuration | Config 1 |  | SMTC.1 |
| OCNG Patterns |  | OCNG pattern 1 |
| PDSCH/PDCCH subcarrier spacing | Config 1 | kHz | 30 kHz |
| EPRE ratio of PSS to SSS | dB | 0 | 0 | 0 | 0 | 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) |  |  |  |  |  |  |  |
| Note2 | Config 1 | NR\_TDD\_FR1\_I |  | Not applicableNote 5 | -94 | TBD |
| Note2 | Config 1 | NR\_TDD\_FR1\_I | dBm/SCS | Not applicableNote 5 | -91 | TBD |
|  Note6 | dB | 2.46 | -5.97 | 2.46 | -5.97 | TBD | TBD |
|  Note6 | dB | 6 | 1 | 6 | 1 | TBD | TBD |
| SS-RSRPNote3 | Config 1 | NR\_TDD\_FR1\_I | dBm/SCS | Not applicableNote 5 | Not applicableNote 5 | -85 | -90 | TBD | TBD |
| IoNote3 | Config 1 | NR\_TDD\_FR1\_I | dBm/38.16MHz | Not applicableNote 5- | -51.99 | TBD |
| Propagation condition | - | AWGN |
| Antenna configuration |  | 1x2 |
| NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.NOTE 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.NOTE 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.NOTE 5: Subtest 1 is not used when testing with 30kHz SSB SCS.NOTE 6: The signal levels apply for SSS REs when the discovery burst is transmitted during DBT windows. |

##### A.11.6.1.2.3 Test Requirements

The SS-RSRP measurement accuracy for cell 2 and cell 3 shall fulfil absolute requirement in clause 10.1.27.1.1 and relative requirement in clause 10.1.27.1.2.

### <End of Change 2>