**3GPP TSG-RAN4 Meeting #95-e *R4-2008584***

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

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | 0841 | **rev** | **1** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *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 on test cases for CLI-RSSI measurement accuracy in FR2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_CLI\_RIM-Perf | | | | |  | ***Date:*** | | | 2020-05-11 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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 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:*** | | DratfCR endorsed in R4-2005304 in RAN4#94-e-bis with following new updates:  - update CLI-RSSI resource configuration to align with R4-2005299  - clarify that RMC/OCNG is not trasnmitted on CLI-RSSI resource and 2 symbol before  It is agreed to introduce CLI-RSSI measurement accuracy test cases. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduce CLI-RSSI measurement accuracy test cases FR2 for both EN-DC and SA. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | CLI-RSSI measurement accuracy is not verified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.5.7.5, A.7.7.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **x** |  | Test specifications | | | | 38.533 | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of Change 1>

A.5.7.5.2 EN-DC CLI-RSSI measurement accuracy with FR2 serving cell

A.5.7.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CLI-RSSI measurement accuracy is within the specified limits. This test will verify the requirements in Clauses 10.1.22.2.1 with the testing configurations for NR cells in Table A.5.7.5.2.1-1.

**Table A.5.7.5.2.1-1: Applicable NR configurations for FR2 CLI-RSSI accuracy test**

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

A.5.7.5.2.2 Test parameters

In this set of test cases there are two cells in the test, E-UTRAN PCell (Cell 1), FR2 PSCell (Cell 2). The test parameters and applicability for Cell 1 are defined in A.3.7.2. The test parameters for the Cell 2 are given in Table A.5.7.5.2.2-1 and A.5.7.5.2.2-2 below.

Before the test UE is configured to perform CLI-RSSI measurement. There is no measurement gap configured in the test. During the test, the test system does not transmit PDCCH/PDSCH/OCNG on symbols for CLI-RSSI resource and on 2 data symbol before. The CLI-RSSI measurement resource configuration is in Table A.5.7.5.2.2-3.

**Table A.5.7.5.2.2-1: FR2 test parameters for CLI-RSSI accuracy**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Config** | **Unit** | **Test 1** | **Test 2** |
| SSB GSCN | 1~2 |  | freq1 | freq1 |
| Duplex mode | 1~2 |  | TDD | TDD |
| TDD configuration | 1~2 |  | TDDConf.3.1 | TDDConf.3.1 |
| BWchannel | 1~2 | MHz | 100: NRB,c = 66 | 100: NRB,c = 66 |
| PDSCH Reference measurement channel | 1~2 |  | SR.3.1 TDD | SR.3.1 TDD |
| RMSI CORESET Reference Channel | 1~2 |  | CR.3.1 TDD | CR.3.1 TDD |
| Dedicated CORESET Reference Channel | 1~2 |  | CCR.3.1 TDD | CCR.3.1 TDD |
| SSB configuration | 1~2 |  | SSB.3 FR2 | SSB.3 FR2 |
| OCNG Patterns Note2 | 1~2 |  | OP.1 | OP.1 |
| TRS configuration | 1~2 |  | TRS.2.1 TDD | TRS.2.1 TDD |
| Initial BWP Configuration | 1~2 |  | DLBWP.0.1  ULBWP.0.1 | DLBWP.0.1  ULBWP.0.1 |
| Dedicated BWP configuration | 1~2 |  | DLBWP.1.3  ULBWP.1.3 | DLBWP.1.3  ULBWP.1.3 |
| SMTC configuration | 1~2 |  | SMTC.1 | SMTC.1 |
| Time offset between DL from serving cell and OCNG from test system | 1~2 | μs | 10.67 | 10.67 |
| EPRE ratio of PSS to SSS | 1~2 | 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 DMRS |
| EPRE ratio of OCNG DMRS to SSSNote 1 |
| EPRE ratio of OCNG to OCNG DMRS Note 1 |
| Propagation condition | 1~2 |  | AWGN | AWGN |
| Antenna configuration | 1~2 |  | 1x2 | 1x2 |
| Note 1: OCNG shall be used such that a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: OCNG is not transmitted in the CLI-RSSI measurement resources. | | | | |

**Table A.5.7.1.1.2-3: CLI-RSSI accuracy OTA related test parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **T1** | **T2** |
| Angle of arrival configuration |  | Setup 1 defined A.3.15.1 | |
| on CLI-RSSI measurement resource Note1 | dBm/15kHzNote3 | -100 | |
| on CLI-RSSI measurement resource Note1 | dBm/SCSNote3 | -91 | |
| on CLI-RSSI measurement resource | dB | -Infinity | |
| RSRP on CLI-RSSI measurement resource Note2 | dBm/SCS | -Infinity | |
| BBon CLI-RSSI measurement resource Note4 | dB | -Infinity | |
| Io on CLI-RSSI measurement resource Note2 | dBm/95.04 MHz Note3 | -62.01 | |
| Io on CLI-RSSI measurement resource Note2 | dBm/1.08 MHz | -81.46 | |
| Note 1: Where used, 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: SRS\_RP, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: Equivalent power received by an antenna with 0 dBi gain at the centre of the quiet zone  Note 4: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 36.101-2 [19], and an allowance of 2dB for UE multi-band relaxation factor ∑MBP from TS 38.101-2 [19] Table 6.2.1.3-4. | | | |

**Table A.5.7.5.2.2-3: CLI-RSSI measurement resource configuration for FR2 CLI-RSSI accuracy**

|  |  |  |
| --- | --- | --- |
|  | Field | SRSConf.1 |
| CLI-RSSI measurement resource | rssi-ResourceId | 0 |
| rssi-SCS | 120kHz |
| startPRB | 0 |
| nrofPRBs | 66 |
| startPosition | 3 |
| nrofSymbols | 11 |
| rssi-PeriodicityAndOffset | sl160, 25 |

A.5.7.5.2.3 Test Requirements

The CLI-RSSI measurement accuracy shall fulfil the absolute accuracy requirements in clauses 10.1.22.2.1. The following requirements are to be verified:

During T1:

The UE is deemed to meet the requirement if the reported CLI-RSSI is in the range shown in table A.5.7.5.2.3-1.

During T2:

The UE is deemed to meet the requirement if the reported CLI-RSSI is in the range shown in table A.5.7.1.1.3-1.

**Table A.5.7.5.2.3-1: SS-RSRP absolute accuracy test requirement**

|  |  |
| --- | --- |
|  | **Test requirement** Notes1,2,3 |
|  | Io -δ +Gmin ≤ Reported CLI-RSSI(dBm) ≤Io +δ +Gmax |
| Note 1: Io is the equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone configured in the test for 1.08MHz  Note 2: δ is the RSRP absolute accuracy requirement from Table 10.1.22.1.1-2, selected according to the Io used in the test  Note 3: Gmin and Gmax are the minimum and maximum UE gain values from Table B.2.1.5.1-1, selected according to the UE power class | |

<End of Change 1>

<Start of Change 2>

A.7.7.5.2 SA CLI-RSSI measurement accuracy with FR2 serving cell

A.7.7.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CLI-RSSI measurement accuracy is within the specified limits. This test will verify the requirements in Clauses 10.1.22.2.1 with the testing configurations for NR cells in Table A.7.7.5.2.1-1.

**Table A.7.7.5.2.1-1: Applicable NR configurations for FR2 CLI-RSSI accuracy test**

|  |  |
| --- | --- |
| **Config** | **Description** |
| 1 | 120 kHz SRS SCS, 100 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations in each supported band | |

A.7.7.5.2.2 Test parameters

In this set of test cases there is one cell in the test, FR2 PCell (Cell 1). The test parameters for the Cell 1 are given in Table A.7.7.5.2.2-1 and A.7.7.5.2.2-2 below.

Before the test UE is configured to perform CLI-RSSI measurement. There is no measurement gap configured in the test. During the test, the test system does not transmit PDCCH/PDSCH/OCNG on symbols for CLI-RSSI resource and on 2 data symbol before. The CLI-RSSI measurement resource configuration is in Table A.7.7.5.2.2-3.

**Table A.7.7.5.2.2-1: FR2 test parameters for CLI-RSSI accuracy**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Config** | **Unit** | **Test 1** | **Test 2** |
| SSB GSCN | 1 |  | freq1 | freq1 |
| Duplex mode | 1 |  | TDD | TDD |
| TDD configuration | 1 |  | TDDConf.3.1 | TDDConf.3.1 |
| BWchannel | 1 | MHz | 100: NRB,c = 66 | 100: NRB,c = 66 |
| PDSCH Reference measurement channel | 1 |  | SR.3.1 TDD | SR.3.1 TDD |
| RMSI CORESET Reference Channel | 1 |  | CR.3.1 TDD | CR.3.1 TDD |
| Dedicated CORESET Reference Channel | 1 |  | CCR.3.1 TDD | CCR.3.1 TDD |
| SSB configuration | 1 |  | SSB.3 FR2 | SSB.3 FR2 |
| OCNG Patterns Note2 | 1 |  | OP.1 | OP.1 |
| TRS configuration | 1 |  | TRS.2.1 TDD | TRS.2.1 TDD |
| Initial BWP Configuration | 1 |  | DLBWP.0.1  ULBWP.0.1 | DLBWP.0.1  ULBWP.0.1 |
| Dedicated BWP configuration | 1 |  | DLBWP.1.3  ULBWP.1.3 | DLBWP.1.3  ULBWP.1.3 |
| SMTC configuration | 1 |  | SMTC.1 | SMTC.1 |
| Time offset between DL from serving cell and OCNG from test system | 1 | μs | 10.67 | 10.67 |
| EPRE ratio of PSS to SSS | 1 | 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 DMRS |
| EPRE ratio of OCNG DMRS to SSSNote 1 |
| EPRE ratio of OCNG to OCNG DMRS Note 1 |
| Propagation condition | 1 |  | AWGN | AWGN |
| Antenna configuration | 1 |  | 1x2 | 1x2 |
| Note 1: OCNG shall be used such that a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: OCNG is not transmitted in the CLI-RSSI measurement resources. | | | | |

**Table A.5.7.1.1.2-3: CLI-RSSI accuracy OTA related test parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **T1** | **T2** |
| Angle of arrival configuration |  | Setup 1 defined A.3.15.1 | |
| on CLI-RSSI measurement resource Note1 | dBm/15kHzNote3 | -100 | |
| on CLI-RSSI measurement resource Note1 | dBm/SCSNote3 | -91 | |
| on CLI-RSSI measurement resource | dB | -Infinity | |
| RSRP on CLI-RSSI measurement resource Note2 | dBm/SCS | -Infinity | |
| BBon CLI-RSSI measurement resource Note4 | dB | -Infinity | |
| Io on CLI-RSSI measurement resource Note2 | dBm/95.04 MHz Note3 | -62.01 | |
| Io on CLI-RSSI measurement resource Note2 | dBm/1.08 MHz | -81.46 | |
| Note 1: Where used, 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: SRS\_RP, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: Equivalent power received by an antenna with 0 dBi gain at the centre of the quiet zone  Note 4: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 36.101-2 [19], and an allowance of 2dB for UE multi-band relaxation factor ∑MBP from TS 38.101-2 [19] Table 6.2.1.3-4. | | | |

**Table A.7.7.5.2.2-3: CLI-RSSI measurement resource configuration for FR2 CLI-RSSI accuracy**

|  |  |  |
| --- | --- | --- |
|  | Field | SRSConf.1 |
| CLI-RSSI measurement resource | rssi-ResourceId | 0 |
| rssi-SCS | 120kHz |
| startPRB | 0 |
| nrofPRBs | 66 |
| startPosition | 3 |
| nrofSymbols | 11 |
| rssi-PeriodicityAndOffset | sl160, 25 |

A.7.7.5.2.3 Test Requirements

The CLI-RSSI measurement accuracy shall fulfil the absolute accuracy requirements in clauses 10.1.22.2.1. The following requirements are to be verified:

During T1:

The UE is deemed to meet the requirement if the reported CLI-RSSI is in the range shown in table A.7.7.5.2.3-1.

During T2:

The UE is deemed to meet the requirement if the reported CLI-RSSI is in the range shown in table A.5.7.1.1.3-1.

**Table A.7.7.5.2.3-1: SS-RSRP absolute accuracy test requirement**

|  |  |
| --- | --- |
|  | **Test requirement** Notes1,2,3 |
|  | Io -δ +Gmin ≤ Reported CLI-RSSI(dBm) ≤Io +δ +Gmax |
| Note 1: Io is the equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone configured in the test for 1.08MHz  Note 2: δ is the RSRP absolute accuracy requirement from Table 10.1.22.1.1-2, selected according to the Io used in the test  Note 3: Gmin and Gmax are the minimum and maximum UE gain values from Table B.2.1.5.1-1, selected according to the UE power class | |

<End of Change 2>