3GPP TSG-RAN WG4 Meeting #112 R4-2413001

**Maastricht, NL, 19 Aug. 2024– 23 Aug. 2024**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **4879** | **rev** | **-** | **Current version:** | **18.6.0** |  |
|  | | | | | | | | |
| *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 TS 38.133 on maintenance of multi-rx TC | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_FR2\_multiRX\_DL-Perf | | | | |  | ***Date:*** | | | 2024-08-09 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | AoA setup number needs to be updated | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | AoA setup is updated | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The multi-rx feature is not complete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.7.5.16, A.7.7.14 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **Y** |  | Test specifications | | | | TS 38.533 | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of Change #1>

### A.7.5.16 UE L1-RSRP Scheduling and Measurement Restrictions on FR2-1

#### A.7.5.16.1 Test Purpose and Environment

The purpose is to verify that the NR UE correctly follows the L1-RSRP scheduling restrictions requirements defined in clause 9.5.6.3 and measurement restrictions defined in clause 9.5.5.2.

There is no measurement gap and no DRX configured in the test. The test has higher layer parameter *timeRestrictionForChannelMeasurements* configured. The test is for sDCI based sceneriao and consists of two time periods, T1 and T2.

Before the test starts,

- UE is connected to Cell 1 (PCell) on radio channel 1 (PCC).

- UE is configured with *groupBasedBeamReporting-r17* for SSB index 0 and SSB index 1.

- UE is configured with 2 different TCI states for PCell, PDCCH TCI state 0 (QCL-ed to SSB0) and TCI state 1 (QCL-ed to SSB1).

- *tci-PresentInDCI* is not configured in the PDSCH configuration, i.e. TCI state for the PDSCH is identical to the PDCCH TCI state. During T1, the time multiplexed (allocation in Frequency is symbolic) downlink transmissions from each Angle of Arrival (AoA1 and AoA2) is shown in Figure A.7.5.16.1-1. UE transmits periodic L1-RSRP group-based beam reports for SSB index 0 and SSB index 1. After UE transmits first valid L1-RSRP group-based beam report, TCI state 0 and TCI state 1 are activated for CORESET index p and CORSET index q which indicates for 2 PDSCH reception.

During T2, the time multiplexed (allocation in Frequency is symbolic) downlink transmissions from each Angle of Arrival is shown in Figure A.7.5.16.1-2. At the beginning of T2, the CSI-RS resource index 0 and CSI-RS resource index 1 are configured for measurement resources for L1-RSRP. CSI-RS resource 0 is QCL-ed to SSB index 0, and CSI-RS resource 1 is QCL-ed to SSB index 1. During T2, CSI-RS resource 0 is transmitted on AoA1 and CSI-RS resource 1 is transmitted on AoA2. During T2, after the CSI-RS configuration, PDSCH is always scheduled on the symbols overlapping with CSI-RS resource symbols.

For scheduling restriction relaxation, the UE is required to receive both PDSCHs on the symbols overlapped with CSI-RS configured for L1-RSRP and sends ACK correctly.

For measurement restriction relaxation, the UE is required to measure both CSI-RS resource index 0 and CSI-RS resource index 1 at the same time from the beginning of T2.

The test parameters are given in table A.7.5.16.1-1, table A.7.5.16.1-2, table A.7.5.16.1-3 and table A.7.5.16.1-4 below.

Table A.7.5.16.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |

Table A.7.5.16.1-2: General test parameters for NR L1-RSRP scheduling and measurement restriction test case in FR2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | | **Comment** |
| RF Channel Number |  | 1 | |  |
| SSB configuration |  | SSB.1 FR2 | |  |
| SMTC configuration |  | SMTC pattern 1 | |  |
| CSI-RS configuration for CSI reporting |  | CSI-RS.3.4A TDD | CSI-RS.3.5A TDD | 2 CSI-RS resources configured |
| CSI-RS resource index |  | 0 | 1 |  |
| reportConfigType |  | periodic | periodic |  |
| reportQuantity |  | cri-RSRP | cri-RSRP |  |
| CSI reporting periodicity | slot | 80 | 80 |  |
| DRX cycle length | s | OFF | |  |
| T1 | s | [0.8] | |  |
| T2 | s | [0.5] | |  |

Table A.7.5.16.1-3: Cell specific test parameters for NR L1-RSRP scheduling and measurement restriction test case in FR2

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Cell 1 |
| Duplex mode |  | TDD |
| TDD configuration |  | TDDConf.3.1 |
| BWchannel | MHz | 100: NRB,c = 66 |
| Data RBs allocated |  | 24 |
| PDSCH/PDCCH subcarrier spacing | KHz | 120 |
| PDSCH Reference measurement channel QCL-ed to SSB index 0 |  | SR.3.2 TDD |
| PDSCH Reference measurement channel QCL-ed to SSB index 1 |  | SR.3.2 TDD |
| RMSI CORESET RMC configuration |  | CR.3.1 TDD |
| Dedicated CORESET (CORESET index p) RMC configuration QCL-ed to SSB index 0 |  | CCR.3.1 TDD |
| Dedicated CORESET (CORESET index q) RMC configuration QCL-ed to SSB index 1 |  | CCR.3.1 TDD |
| PDSCH TCI state QCL-ed to SSB index 0 |  | TCI.State.0 |
| PDSCH TCI state QCL-ed to SSB index 1 |  | TCI.State.1 |
| OCNG Pattern |  | OP.4 defined in A.3.2.1 |
| Initial BWP configuration |  | DLBWP.0.1  ULBWP.0.1 |
| Dedicated UL BWP configuration |  | DLBWP.1.3  ULBWP.1.3 |
| TRS Configuration QCL-ed to SSB index 0 |  | TRS.2.1 TDD |
| TRS Configuration QCL-ed to SSB index 1 |  | TBD |
| 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 DMRS |
| EPRE ratio of OCNG DMRS to SSSNote 1 |
| EPRE ratio of OCNG to OCNG DMRS Note 1 |
| 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 | | |

Table A.7.5.16.1-4: NR OTA test parameters for NR L1-RSRP scheduling and measurement restriction test case in FR2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | SSB index 0 | | SSB index 1 | |
|  |  | T1 | T2 | T1 | T2 |
| Angle of arrival configuration |  | Setup 5 according to A.3.15.X1 | | | |
| AoA1 | | AoA2 | |
| Beam AssumptionNote 2 |  | Rough | | Rough | |
| SSB  Note1, 3 | dB | -2.1 | | -2.1 | |
| SSB\_RP Note1 | dBm/ SCS | -91 | | -91 | |
| CSI\_RS\_RP | dBm/ SCS | N/A | [-85] | N/A | [-85] |
| Io Note 4 | dBm/95.04MHz | -66.41 | | -66.41 | |
| Time multiplexing of the downlink transmissions from each AoA |  | Defined in Figure A.7.5.16.1-1 for T1 and Figure A.7.5.16.1-2 for T2 | | | |
| Note 1: SSB Es/Iot, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 2: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation  Note 3: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 38.101-2 [19], and an allowance of 1dB for UE multi-band relaxation factor ΔMBP from TS 38.101-2 [19] Table 6.2.1.3-4.  Note 4: Calculation of Io does not consider the different power level between CSI-RS and SSB | | | | | |

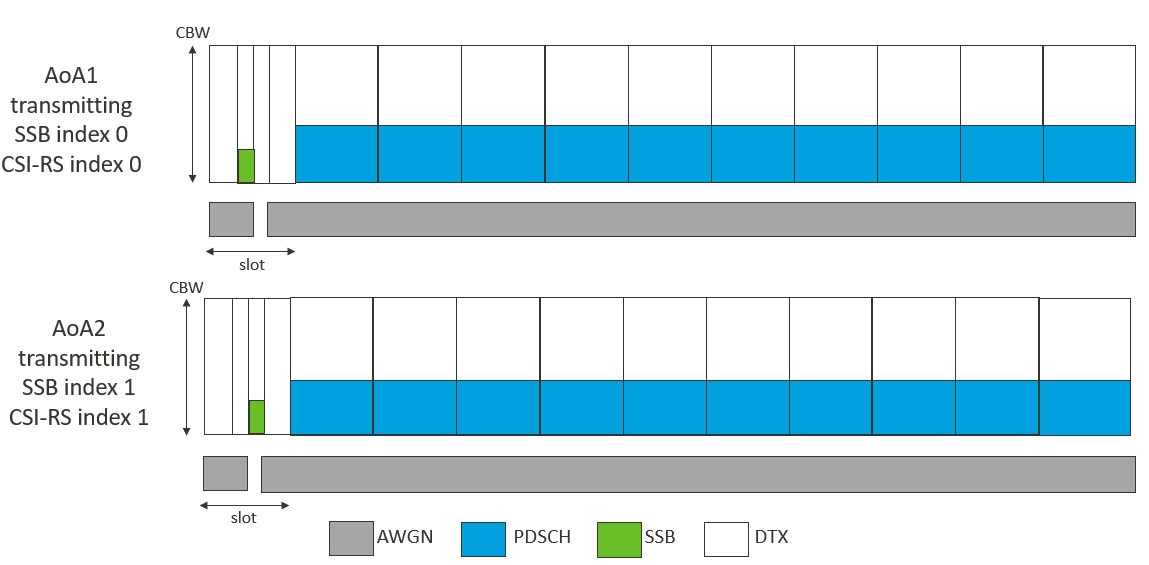


Figure A.7.5.16.1-1: Time multiplexed downlink transmissions during T1

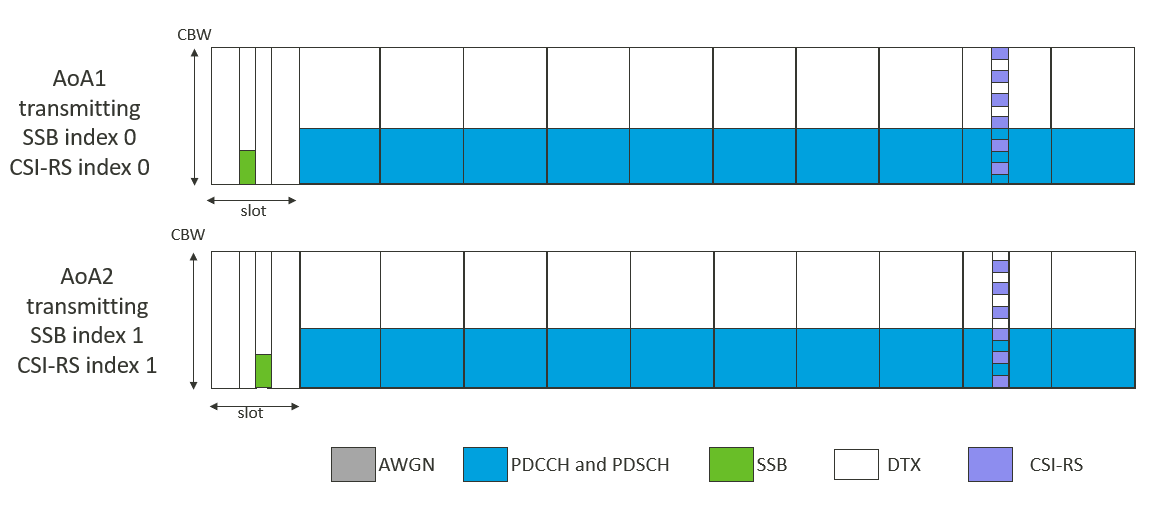


Figure A.7.5.16.1-2: Time multiplexed downlink transmissions during T2

#### A.7.5.16.2 Test Requirements

The UE behaviour follows the requirements defined in clause 9.5.6.3 and 9.5.5.2.

During T2,

- UE is required to receive both PDSCHs and send ACK correctly.

- No later than Y + 80 slot from the beginning of time period T2, UE shall send L1-RSRP report including the valid results for both CSI-RS resource 0 and CSI-RS resource 1 while meeting the accuracy requirements defined in clause 10.1.X.

- Y is the RRC processing delay, which is 10ms

<End of Change #1>

<Start of Change #2>

### A.7.7.14 L1-RSRP measurement for group-based beam reporting

#### A.7.7.14.1 SSB based L1-RSRP measurement

##### A.7.7.14.1.1 Test Purpose and Environment

The purpose of this test is to verify that the L1-RSRP measurement accuracy for group-based beam reporting is within the specified limits. This test will verify the requirements in clauses 9.5.2 and clause 10.1.20.1 for L1-RSRP measurements based on SSB with the testing configurations for NR cells in Table A.7.7.14.1.1-1.

The AoA setup for this test is Setup X1 as defined in clause A.3.15.X1.

Table A.7.7.14.1.1-1: Applicable NR configurations for FR2 SSB based L1-RSRP test

|  |  |
| --- | --- |
| Config | Description |
| 1 | NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 2 | NR 240 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 in each supported band | |

##### A.7.7.14.1.2 Test parameters

In this set of test cases there is one cell in the test, PCell (Cell 1). The test parameters for the Cell 1 are given in Table A.7.7.14.1.2-1 and Table A.7.7.14.1.2-2 below. The absolute and relative accuracy of L1-RSRP measurements is tested by using the parameters in Table A.7.7.14.1.2-1 and Table A.7.7.14.1.2-2.

There is no measurement gap configured in the test. Before the test, UE is configured two CSI resource sets with one SSB resource in each set. UE is configured to perform RLM, BFD measurement based on the SSB resources 0 and UE is configured to perform group-based L1-RSRP measurement based on the SSB resources 0 and 1.

Table A.7.7.14.1.2-1: FR2 SSB based L1-RSRP general test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 |
| Data RBs allocated | 1, 2 |  | 66 | 66 |
| PDSCH Reference measurement channel | 1 |  | SR.3.2 TDD | SR.3.2 TDD |
| 2 | SR.3.3 TDD | SR.3.3 TDD |
| RMSI CORESET Reference Channel | 1 |  | CR.3.1 TDD | CR.3.1 TDD |
| 2 | CR.3.2 TDD | CR.3.2 TDD |
| Dedicated CORESET Reference Channel | 1 |  | CCR.3.1 TDD | CCR.3.1 TDD |
| 2 | CCR.3.7 TDD | CCR.3.7 TDD |
| SSB configuration | 1 |  | SSB.1 FR2 | SSB.1 FR2 |
|  | 2 |  | SSB.2 FR2 | SSB.2 FR2 |
| OCNG Patterns | 1, 2 |  | OP.1 | OP.1 |
| 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 |
| TRS Configuration | 1, 2 |  | TRS.2.1 TDD | TRS.2.1 TDD |
| PDCCH/PDSCH TCI Configuration | 1, 2 |  | TCI.State.2 | TCI.State.2 |
| SMTC configuration | 1, 2 |  | SMTC.1 | SMTC.1 |
| reportConfigType | 1, 2 |  | periodic | periodic |
| reportQuantity | 1, 2 |  | ssb-Index-RSRP | ssb-Index-RSRP |
| Number of reported RS | 1, 2 |  | 2 | 2 |
| L1-RSRP reporting period | 1, 2 |  | slot320 | slot320 |
| Propagation condition | 1, 2 |  | AWGN | AWGN |
| Antenna configuration | 1, 2 |  | 1x2 | 1x2 |
| 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 |  |  |  |  |
| 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. | | | | |

Table A.7.7.14.1.2-2: FR2 SSB based L1-RSRP OTA related test parameters

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Config | Unit | Test 1 | | Test 2 NOTE 3 | |
|  |  |  | SSB0 | SSB1 | SSB0 | SSB1 |
| Angle of arrival configuration |  |  | Setup 5 according to A.3.15.5 | | Setup 5 according to A.3.15.5 | |
| Assumption for UE beamsNote 4 |  |  | Rough | | Rough | |
|  | 1~2 | dBm/15kHz | -100 | | n.a. | |
|  | 1 | dBm/SSB SCS | -91 | | n.a. | |
|  | 2 |  | -88 | | n.a. | |
|  | 1~2 | dB | 10 | -2 | n.a. | |
| SSB\_RPNote1 | 1 | dBm/SCS | -81 | -93 | As in Table B.2.4-2 | |
|  | 2 |  | -78 | -90 | As in Table B.2.4-2 | |
| IoNote1 | 1~2 | dBm/  95.04MHz | -51.57 | | SSB\_RP+28.98 | |
|  | 1~2 | dB | 10 | -2 | n.a. | |
| Note 1: SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 2: Void  Note 3: No additional noise is added by the test system in Test 2.  Note 4: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation | | | | | | |

##### A.7.7.14.1.3 Test Requirements

After 320ms from the beginning of the test, the L1-RSRP measurement accuracy for SSB#0 and SSB#1 of Cell 1 shall fulfil the requirements in clauses 10.1.20.1. The following requirements are to be verified:

For Test 1:

Absolute accuracy of SSB0 and SSB1. The UE is deemed to meet the requirement if the reported L1-RSRP is in the range shown in Table A.7.7.14.1.3-1.

Relative accuracy of SSB0 compared with SSB1. The UE is deemed to meet the requirement if the difference in reported L1-RSRP meets the requirements in Table 10.1.20.1.2-1.

For Test 2:

Absolute accuracy of SSB resource reported by UE in L1-RSRP report (SSB0 or SSB1). The UE is deemed to meet the requirement if the reported L1-RSRP is in the range shown in Table A.7.7.14.1.3-1.

Relative accuracy of SSB0 compared with SSB1. The UE is deemed to meet the requirement if the difference in reported L1-RSRP meets the requirements in Table 10.1.20.1.2-1.

Table A.7.7.14.1.3-1: L1-RSRP absolute accuracy test requirement

|  |  |
| --- | --- |
|  | Test requirement Notes1,2,3 |
| SSB0 | SSB\_RP0 - δ + Gmin ≤ Reported RSRP (dBm) ≤ SSB\_RP0 + δ + Gmax |
| SSB1 | SSB\_RP1 - δ + Gmin ≤ Reported RSRP (dBm) ≤ SSB\_RP1 + δ + Gmax |
| Note 1: SSB\_RPn is the equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone configured in the test for the SSB n under consideration  Note 2: δ is the RSRP absolute accuracy requirement from Table 10.1.20.1.1-1, 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 | |

#### A.7.7.14.2 CSI-RS based L1-RSRP measurement on resource set with repetition off

##### A.7.7.14.2.1 Test Purpose and Environment

The purpose of this test is to verify that the L1-RSRP measurement accuracy for group-based beam reporting is within the specified limits. This test will verify the requirements in clauses 9.5.3 and clause 10.1.20.2 for L1-RSRP measurements based on CSI-RS with the testing configurations for NR cells in Table A.7.7.14.2.1-1.

The AoA setup for this test is Setup X1 as defined in clause A.3.15.X1.

Table A.7.7.14.2.1-1: Applicable NR configurations for FR1 CSI-RS based L1-RSRP test

|  |  |
| --- | --- |
| Config | Description |
| 1 | NR 120 kHz CSI-RS SCS, 100 MHz bandwidth, TDD duplex mode |

##### A.7.7.14.2.2 Test parameters

In this set of test cases there is one cell in the test, PCell (Cell 1). The test parameters for the Cell 1 are given in Table A.7.7.14.2.2-1 and Table A.7.7.14.2.2-2 below. The absolute and relative accuracy of L1-RSRP measurements is tested by using the parameters in Table A.7.7.14.2.2-1 and Table A.7.7.14.2.2-2.

There is no measurement gap configured in the test. Before the test, UE is configured two CSI resource sets with one CSI-RS resource in each set. UE is configured to perform RLM and BFD based on SSB 0 and 1 and UE is configured to perform group-based L1-RSRP measurement based on the CSI resources. CSI-RS resources are not transmitted in the same OFDM symbols as SSB.

Table A.7.7.14.2.2-1: FR2 CSI-RS based L1-RSRP general test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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.1 FR2 | SSB.1 FR2 |
| OCNG Patterns | 1 |  | OP.1 | OP.1 |
| Initial BWP Configuration | 1 |  | DLBWP.0.1  ULBWP.0.1 | DLBWP.0.1  ULBWP.0.1 |
| Dedicated BWP configuration | 1 |  | DLBWP.1.1  ULBWP.1.1 | DLBWP.1.1  ULBWP.1.1 |
| TRS Configuration | 1 |  | TRS.2.1 TDD | TRS.2.1 TDD |
| PDCCH/PDSCH TCI Configuration | 1 |  | TCI.State.2 | TCI.State.2 |
| SMTC configuration | 1 |  | SMTC.1 | SMTC.1 |
| CSI-RS resource sets | 1 |  | TBD | TBD |
| reportConfigType | 1 |  | periodic | periodic |
| reportQuantity | 1 |  | cri-RSRP | cri-RSRP |
| Number of reported RS | 1 |  | 2 | 2 |
| L1-RSRP reporting period | 1 |  | slot80 | slot80 |
| Propagation condition | 1 |  | AWGN | AWGN |
| Antenna configuration | 1 |  | 1x2 | 1x2 |
| 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 |  |  |  |  |
| 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. | | | | |

Table A.7.7.14.2.2-2: FR2 CSI-RS based L1-RSRP OTA related test parameters

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Config | Unit | Test 1 | | Test 2 NOTE 3 | |
|  |  |  | CSI-RS0 | CSI-RS1 | CSI-RS0 | CSI-RS1 |
| Angle of arrival configuration |  |  | Setup 5 according to A.3.15.5 | | Setup 5 according to A.3.15.5 | |
| Assumption for UE beamsNote 4 |  |  | Rough | | Rough | |
|  | 1~2 | dBm/15kHz | -100 | | n.a. | |
|  | 1~2 | dBm/SSB SCS | -91 | | n.a.  n.a. | |
|  | 1~2 | dB | 10 | -2 | n.a. | |
| CSI-RS-RSRPNote1 | 1~2 | dBm/SCS | -81 | -93 | As in Table B.2.4-2 | |
| IoNote1 | 1~2 | dBm/  95.04MHz | -59.86 | | SS-RSRP+28.98 | |
|  | 1~2 | dB | -51.57 | -2 | n.a. | |
| Note 1: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 2: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 3: No additional noise is added by the test system in Test 2.  Note 4: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation | | | | | | |

##### A.7.7.14.2.3 Test Requirements

After 640ms from the beginning of the test, the L1-RSRP measurement accuracy for CSI-RS#0 and CSI-RS#1 of Cell 1 shall fulfil the requirements in clause 10.1.20.2. The following requirements are to be verified:

For Test 1:

Absolute accuracy of CSI-RS0 and CSI-RS1. The UE is deemed to meet the requirement if the reported L1-RSRP is in the range shown in Table A.7.7.14.2.3-1.

Relative accuracy of CSI-RS0 compared with CSI-RS1. The UE is deemed to meet the requirement if the difference in reported L1-RSRP meets the requirements in Table 10.1.20.2.2-1.

For Test 2:

Absolute accuracy of CSI-RS resource reported by UE in L1-RSRP report (CSI-RS0 or CSI-RS1). The UE is deemed to meet the requirement if the reported L1-RSRP is in the range shown in Table A.7.7.14.2.3-1.

Relative accuracy of CSI-RS0 compared with CSI-RS1. The UE is deemed to meet the requirement if the difference in reported L1-RSRP meets the requirements in Table 10.1.20.2.2-1.

Table A.7.7.14.2.3-1: L1-RSRP absolute accuracy test requirement

|  |  |
| --- | --- |
|  | Test requirement Notes1,2,3 |
| CSI-RS0 | CSI-RS \_RP0 – δ + Gmin ≤ Reported RSRP(dBm) ≤CSI-RS \_RP0 + δ + Gmax |
| CSI-RS1 | CSI-RS \_RP1 – δ + Gmin ≤ Reported RSRP(dBm) ≤CSI-RS \_RP1 + δ + Gmax |
| Note 1: CSI-RS\_RPn is the equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone configured in the test for the CSI-RS n under consideration  Note 2: δ is the RSRP absolute accuracy requirement from Table 10.1.20.2.1-1, 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>