**3GPP TSG-RAN WG4 Meeting #97-e *R4-2017060***

 **Online, 02nd – 13th November 2020**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **1343** | **rev** | **1** | **Current version:** | **15.11.0** |  |
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| *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: Corrections to inter-RAT FR2 test cases (Rel-15) |
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| ***Source to WG:*** | Rohde & Schwarz |
| ***Source to TSG:*** | R4 |
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| ***Work item code:*** | NR\_newRAT-Perf |  | ***Date:*** | 2020-11-11 |
|  |  |  |  |  |
| ***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 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)* |
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| ***Reason for change:*** | In TCs for FR2 inter-RAT measurement accurycy there are several inconsistencies:* SSB Configuration is missing.
* UE beam assumption is missing.
* OTA parameters (Noc, Es, Es/Noc) not given explicitely in the table, but through Notes, which are also not consistent since they refer to spherical coverage and do not account for 1dB band relaxation or UE internal noice when close to Refsens .
* Bandgroups are redundant since test parameters are defined band agnostic.
* Redundant / missleading table Notes.
* Relative accuracy mentioned in the test purpose, though only one cell is measured in the test.
* Editorial inconsistencies
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| ***Summary of change:*** | In TCs A.8.5.2.1.2, A.8.5.2.2.2, A.8.5.2.3.2* SSB configuration (SSB.3 FR2) added.
* Rough beam assumption added in the OTA parameter table.
* OTA parameters (Noc, Es, Es/Noc) given explicitely in the table.
* Es/Noc moved from general to OTA parameters.
* Table Notes corrected, missing ones added, redundant ones voided.
* Band groups removed.
* Removed Relative accuracy from the test purpose (similar as for Inter-RAT FR1).
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| ***Consequences if not approved:*** | Ambiguous and incorrect specification leading to wrong TC implementation. |
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| ***Clauses affected:*** | A.8.5.2.1.2, A.8.5.2.2.2, A.8.5.2.3.2 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **x** |  |  Test specifications | TS 38.533 CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** | **Crucial change:** RAN5 cannot complete the above tests. |
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| ***This CR's revision history:*** | **R4-2017060** is the first revision of **R4-2015995** |

**< Unchanged sections omitted >**

##### A.8.5.2.1.2 E-UTRAN – NR inter-RAT measurements with FR2 target cell

###### A.8.5.2.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SS-RSRP measurement accuracy is within the specified limits. This test will verify the requirements in clause 9.11.1 in TS 36.133 [15] for inter-RAT FR2 SS-RSRP measurements.

###### A.8.5.2.1.2.2 Test Parameters

Supported test configurations are shown in Table A.8.5.2.1.2.2-1. In this test case there are two cells on different carriers. Absolute accuracy requirements of SS-RSRP inter-RAT measurement are tested by using test setup in Table A.8.5.2.1.2.2-2 and Table A.8.5.2.1.2.2-3. In all test cases, Cell 2 is target cell. Cell 1 is the E-UTRA cell which specific test parameters for this test case are specified in Table A.3.7.2.1-1.

Table A.8.5.2.1.2.2-1: SS-RSRP Inter-RAT SS-RSRP supported test configurations

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| --- | --- |
| Configuration | 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 |

Table A.8.5.2.1.2.2-2: SS-RSRP Inter-RAT general test parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 |
| Cell 2 | Cell 2 |
| SSB ARFCN |  | Freq1 | freq1 |
| Duplex mode |  | TDD | TDD |
| TDD configuration |  | TDDConf.3.1 | TDDConf.3.1 |
| BWchannel | MHz | 100: NRB,c = 66 | 100: NRB,c = 66 |
| 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 |
| DRX cycle configuration | ms | Not applicable |
| TRS configuration |  | TRS.2.1 TDD |
| TCI state |  | TCI.State.0 |
| PDSCH Reference measurement channel  |  | - | - |
| RMSI CORESET Reference Channel |  | - | - |
| OCNG Patterns |  | OP.1 | OP.1 |
| SMTC configuration |  | SMTC.1  | SMTC.1  |
| SSB configuraiton |  | SSB.3 FR2 | SSB.3 FR2 |
| PDSCH/PDCCH subcarrier spacing | kHz | 120  | 120  |
| 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\_DMRS |
| EPRE ratio of OCNG DMRS to SSSNote 1 |
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| 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: VoidNote 3: VoidNote 4: Void |

Table A.8.5.2.1.2.2-3: SS-RSRP Inter-RAT OTA related test parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 |
| Cell 2 | Cell 2 |
| Angle of arrival configuration |  | Setup 1 according to A.3.15.1 | Setup 1 according to A.3.15.1 |
| Assumption for UE beamsNote 10 |  | Rough | Rough |
| Note1 | dBm/15kHzNote4 | -105 | N/A |
| Note1 | dBm/SCSNote4 | -96 | N/A |
| *Es* | dBm/SCSNote4 |  | (Table B.2.3-2 Rx Beam Peak +1dB)(Note 7) |
|  | dB | 11 | N/A  |
| SSB\_RPNote2 | dBm/SCS Note4 | -85 | (Table B.2.3-2 Rx Beam Peak +1dB)(Note 7) |
| BB Note 2, Note 9 | dB | 9.97 | -3.81 |
| IoNote2 | dBm/95.04 MHz Note4 | -55.65 | (Table B.2.3-2 Rx Beam Peak +30dB)(Note 8) |
| 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: SSB\_RP, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.Note 3: VoidNote 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone.Note 5: VoidNote 6: VoidNote 7: SSB\_RP is applied at 1dB above the minimum level specified in Table B.2.3-2 for beam peak.Note 8: Io is applied at 10log10(792)dB+1dB above the minimum level specified in Table B.2.3-2 for beam peak.Note 9: 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 1dB for UE multi-band relaxation factor ΔMBP from TS 38.101-2 [19] Table 6.2.1.3-4.Note 10: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation. |

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###### A.8.5.2.1.2.3 Test Requirements

The SS-RSRP measurement accuracy for Cell 2 shall fulfil the requirement in clause 9.11.1 in TS 36.133 [15].

**< Unchanged sections omitted >**

##### A.8.5.2.2.2 E-UTRAN – NR inter-RAT measurements with FR2 target cell

###### A.8.5.2.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SS-RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in clause 9.11.2 in TS 36.133 [15] for inter-RAT FR2 SS-RSRQ measurements.

###### A.8.5.2.2.2.2 Test Parameters

Supported test configurations are shown in Table A.8.5.2.2.2.2-1. In this test case there are two cells on different carriers. Absolute accuracy requirements of SS-RSRQ inter-RAT measurement are tested by using test setup in Table A.8.5.2.2.2.2-2 and Table A.8.5.2.2.2.2-3. In all test cases, Cell 2 is target cell. Cell 1 is the E-UTRA cell which specific test parameters for this test case are specified in Table A.3.7.2.1-1.

Table A.8.5.2.2.2.2-1: SS-RSRQ Inter-RAT SS-RSRQ supported test configurations

|  |  |
| --- | --- |
| Configuration | 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 |

Table A.8.5.2.2.2.2-2: SS-RSRQ Inter-RAT general test parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 |
| Cell 2 | Cell 2 |
| SSB ARFCN |  | Freq1 | freq1 |
| Duplex mode |  | TDD | TDD |
| TDD configuration |  | TDDConf.3.1 | TDDConf.3.1 |
| BWchannel | MHz | 100: NRB,c = 66 | 100: NRB,c = 66 |
| 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 |
| DRX cycle configuration | ms | Not applicable |
| TRS configuration |  | TRS.2.1 TDD |
| TCI state |  | TCI.State.0 |
| PDSCH Reference measurement channel  |  | - | - |
| RMSI CORESET Reference Channel |  | - | - |
| OCNG Patterns |  | OP.1 | OP.1 |
| SMTC configuration |  | SMTC.1 | SMTC.1 |
| SSB configuration |  | SSB.3 FR2 | SSB.3 FR2 |
| PDSCH/PDCCH subcarrier spacing | kHz | 120  | 120  |
| 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\_DMRS |
| EPRE ratio of OCNG DMRS to SSSNote 1 |
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| 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: VoidNote 3: VoidNote 4: Void |

Table A.8.5.2.2.2.2-3: SS-RSRQ Inter-RAT OTA related test parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 |
| Cell 2 | Cell 2 |
| Angle of arrival configuration |  | Setup 1 according to A.3.15.1 | Setup 1 according to A.3.15.1 |
| Assumption for UE beamsNote 10 |  | Rough | Rough |
| Note1 | dBm/15kHzNote4 | -105 | (Table B.2.3-2 Rx Beam Peak -5dB)(Note 7) |
| Note1 | dBm/SCS Note4 | -96 | (Table B.2.3-2 Rx Beam Peak +4dB)(Note 7) |
|  | dB | -0.5 | -1.75 |
| SSB\_RPNote2 | dBm/SCS Note4 | -96.5 | (Table B.2.3-2 Rx Beam Peak +2.25dB)(Note 8) |
| SS-RSRQNote2 | dB | -14.4 | -14.82 |
|  Note2 | dB | -0.5 | -1.75 |
| IoNote2 | dBm/95.04 MHz Note4 | -63.9  | (Table B.2.3-2 Rx Beam Peak +35.22dB)(Note 9) |
| 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: SSB\_RP, SS-RSRQ, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.Note 3: VoidNote 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone.Note 5: VoidNote 6: VoidNote 7: Noc for SCS 15kHz is applied at -10log10(8)+4dB above the minimum level specified in Table B.2.3-2 for beam peak. Noc for SCS 120kHz is applied at 4dB above the minimum level specified in Table B.2.3-2 for beam peak.Note 8: SSB\_RP is applied at 2.25dB above the minimum level specified in Table B.2.3-2 for beam peak.Note 9: Io is applied at 10log10(792)+6.22dB above the minimum level specified in Table B.2.3-2 for beam peak.Note 10: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation. |

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###### A.8.5.2.2.2.3 Test Requirements

The SS-RSRQ measurement accuracy for Cell 2 shall fulfil the requirement in clause 9.11.2 in TS 36.133 [15].

In this test case there are two cells on different carriers and measurement gaps are provided

**< Unchanged sections omitted >**

##### A.8.5.2.3.2 E-UTRAN – NR inter-RAT measurements with FR2 target cell

###### A.8.5.2.3.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SS- SINR measurement accuracy is within the specified limits. This test will verify the requirements in clause 9.11.3 in TS 36.133 [15] for inter-RAT FR2 SS-SINR measurements.

###### A.8.5.2.3.2.2 Test Parameters

Supported test configurations are shown in Table A.8.5.2.3.2.2-1. In this test case there are two cells on different carriers. Absolute accuracy requirements of SS-SINR inter-RAT measurement are tested by using test setup in Table A.8.5.2.3.2.2-2 and A.8.5.2.3.2.2-3. In all test cases, Cell 2 is target cell. Cell 1 is the E-UTRA cell which specific test parameters for this test case are specified in Table A.3.7.2.1-1.

Table A.8.5.2.3.2.2-1: SS-SINR Inter-RAT SS-SINR supported test configurations

|  |  |
| --- | --- |
| Configuration | 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 |

Table A.8.5.2.3.2.2-2: SS-SINR Inter-RAT general test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 | Test 3 |
| Cell 2 | Cell 2 | Cell 2 |
| SSB ARFCN |  | Freq1 | freq1 | freq1 |
| Duplex mode |  | TDD | TDD | TDD |
| TDD configuration |  | TDDConf.3.1 | TDDConf.3.1 | TDDConf.3.1 |
| BWchannel | MHz | 100: NRB,c = 66 | 100: NRB,c = 66 | 100: NRB,c = 66 |
| 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 |
| DRX cycle configuration | ms | Not applicable |
| TRS configuration |  | TRS.2.1 TDD |
| TCI state |  | TCI.State.0 |
| PDSCH Reference measurement channel  |  | - | - | - |
| RMSI CORESET Reference Channel |  | - | - | - |
| OCNG Patterns |  | OP.1 | OP.1 | OP.1 |
| SMTC configuration |  | SMTC.1  | SMTC.1 | SMTC.1 |
| SSB configuration |  | SSB.3 FR2 | SSB.3 FR2 | SSB.3 FR2 |
| PDSCH/PDCCH subcarrier spacing | kHz | 120  | 120  | 120  |
| EPRE ratio of PSS to SSS | dB | 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\_DMRS |
| EPRE ratio of OCNG DMRS to SSSNote 1 |
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| 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: Void.Note 3: Void.Note 4: Void. |

Table A.8.5.2.3.2.2-3: SS-SINR Inter-RAT OTA related test parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test 1 | Test 2 | Test 3 |
| Cell 2 | Cell 2 | Cell 2 |
| Angle of arrival configuration |  | Setup 1 according to A.3.15.1  | Setup 1 according to A.3.15.1  | Setup 1 according to A.3.15.1 |
| Assumption for UE beamsNote 10 |  | Rough | Rough | Rough |
| Note1 | dBm/15kHzNote4 | -105 | -105 | (Table B.2.3-2 Rx Beam Peak -5dB)(Note 7) |
| Note1 | dBm/SCSNote4 | -96 | -96 | (Table B.2.3-2 Rx Beam Peak +4dB)(Note 7) |
|  | dB | -0.5 | 11 | -1.0 |
| SSB\_RPNote2 | dBm/SCS Note4 | -96.5 | -85 | (Table B.2.3-2 Rx Beam Peak +3dB)(Note 8) |
| SS-SINRNote2 | dB | -0.5 | 11 | -1.0 |
|  Note2 | dB | -0.5 | 11 | -1.0 |
| IoNote2 | dBm/95.04 MHz Note4 | -69.3  | -55.4 | (Table B.2.3-2 Rx Beam Peak +35.54dB)(Note 9) |
| 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: SSB\_RP, SS-SINR, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.Note 3: VoidNote 4: Equivalent power received by an antenna with 0 dBi gain at the centre of the quiet zone.Note 5: VoidNote 6: VoidNote 7: Noc for SCS 15kHz is applied at -10log10(8)+4dB above the minimum level specified in Table B.2.3-2 for beam peak. Noc for SCS 120kHz is applied at 4dB above the minimum level specified in Table B.2.3-2 for beam peak.Note 8: SSB\_RP is applied at 3dB above the minimum level specified in Table B.2.3-2 for beam peak.Note 9: Io is applied at level 10log10(792)+6.54dB above the minimum level specified in Table B.2.3-2 for beam peak.Note 10: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation. |

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###### A.8.5.2.3.2.3 Test Requirements

The SS-SINR measurement accuracy for Cell 2 shall fulfil the requirement in clause 9.11.3 in TS 36.133 [15].

< End of changes >