**3GPP TSG-RAN WG4 Meeting # 103-eR4-221xxxx**

**Electronic Meeting, 9 - 20 May 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **37.145-2** | **CR** | **<CR#>** | **rev** | **<Rev#>** | **Current version:** | **16.11.0** |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Draft CR to TS 37.145-2 on clarifications of interfering signal for the OTA transmitter intermodulation requirement (REL16) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | MCC, Huawei | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MSR\_GSM\_UTRA\_LTE\_NR-Perf, AASenh\_BS\_LTE\_UTRA-Perf, TEI15 | | | | |  | ***Date:*** | | | 2022-04-25 |
|  |  | | | |  | |  | | |  |
| ***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 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This big CR contains 3 endorsd drfat CR’s :  **R4-2210027**  For the interfering signal for the OTA transmitter intermodulation requirement, it is not clear how the power is split between the supported polarizations, and whether the power is split when the power is 46 dBm but not Prated,t,TRP.  **R4-2207918**  The “a” suffix was removed from ANTCR3a in the endorsed CRs in R4-2207298 in RAN4#102-e, as there is no corresponding “b” in the test configuration. However, ANTCR3a are still being referred to in numerous places in other clauses. There are also table heading errors in clause 7.9.5.1.  **R4-2208568**  RMS detection mode is defined while the required measurement duration is not clarified in current specifications. The corresponding CRs for 38 series were agreed in RAN4#102-e meeting | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | **R4-2210027**  - Clarify the power is split equally between the supported polarizations  - other clarifications related to polarization match and polarization of CLTA  **R4-2207918**  Remove the “a” suffix from ANTCR3a in places where it is referred to. Correct the table heading errors in clause 7.9.5.1.  **R4-2208568**  Clarification on required average time for emission test is added in clause 6.6 and 6.7. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | **R4-2210027**  Ambiguities remain and would lead to different interpretations.  **R4-2207918**  Errors remain and would lead to different interpretations.  **R4-2208568**  The general rule for required average time for emission test is missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.11.2.8.2.2, 4.15.2.2, 5.2, 6.7.3.4.2, 6.7.4.4.2, 6.7.5.4.2, 6.7.6.2.4.2, 6.7.6.3.4.2, 6.7.6.4.4.2, 6.8.4.2, 6.8.5, 7.7.4.2, 7.9.5.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 37.105, 38.104 CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.141-2 CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**<Start of change>**

4.11.2.8.2.2 ATCR5b generation

ATCR5b is based on re-using the existing test configurations applicable for operating bands using multi-band transceiver units and hence have declared multi-band dependencies (see table 4.10-1, D9.16)*.* ATCR5b is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* (see table 4.10-1, D9.17).

- The allocated *Radio Bandwidth* of the outermost bands shall be located at the outermost edges of the declared maximum *Radio Bandwidth* of the operating band with multi-band dependencies (see table 4.10-1, D9.26).

- The maximum number of carriers is limited to two per band. Carriers shall be placed at the outermost edges of the declared maximum *Radio Bandwidth* of the operating band with multi-band dependencies (see table 4.10-1, D9.26).

- Each concerned band shall be considered as an independent band and the corresponding test configuration for non-contiguous operation shall be generated in each band according to table 4.11.2.8.2.2-1. The mirror image of the single band test configuration shall be used in the highest band being tested*.*

- For AAS BS supporting RCSA4 in the band and supports three carriers only, two carriers shall be placed in one band according to ATC2 while the remaining carrier shall be placed at the edge of the maximum *Base Station RF Bandwidth* in the other band.

- If the sum of the maximum *Base Station RF bandwidths* of each of the supported operating bands is greater than the declared *Total RF Bandwidth* BWtot (D9.32) of transmitter and receiver for the declared band combinations of the BS, then repeat the steps above for test configurations where the *Base Station RF Bandwidth* of one of the operating band shall be reduced so that the declared *Total RF Bandwidth* of the operating band with multi-band dependencies (see table 4.10-1, D9.26) is not exceeded and vice versa.

**Table 4.11.2.8.2.2-1: The applicability of test configuration in each band**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **BC** | **RCSA1** | **RCSA2** | **RCSA3** | **RCSA3A** | **RCSA3B** | **RCSA4** | **RCSA5** |
| BC1 | ANTCR1a | ANTCR2 | ANTCR3 | ANTCR7 | ANTCR8 | ANTCR1 | ANTCR2 |
| BC2 | ANTCR1a | ANTCR2 | ANTCR3 | ANTCR7 | ANTCR8 | ANTCR1 | ANTCR2 |
| BC3 | ATCR1b | ANTCR2 | ANTCR3 | ANTCR7 | N/A | N/A | ANTCR2 |

**<Next change>**

#### 4.15.2.2 Co-location test antenna characteristics

A co-location test antenna is a practical passive antenna that is used for conformance testing of the co-location requirements and is based on the definition of the *co-location reference antenna*. A CLTA shall comply to the requirements specified in Table 4.15.2.2-1. Translation of the requirements to other test antennas is not precuded but suitable translations between the *co-location reference antenna* and test antennas must be provided to demonstrate that the method is within the specified MU.

The currently defined CLTAs are suitable for testing AAS BSs implemented with a planar antenna array. The method for testing AAS BS with other antenna array implementations is FFS.

Table 4.15.2.2-1: CLTA characteristics

|  |  |  |
| --- | --- | --- |
| Parameter | in-band CLTA | out-of-band CLTAs |
| Vertical radiating dimension (h) | Test object vertical radiating length ±30% | Test object vertical radiating length ±30%  (Note 2) |
| Horizontal beam width | 65° ± 10° | 65° ± 10° |
| Vertical beam width | N/A | The half-power vertical beam width of the CLTA equals the narrowest declared vertical *beamwidth* ±3°  (Note 2) |
| Polarization (Note 3) | Match (Note 4) | Match to in-band (Note 4) |
| Conducted interface return loss | > 10dB | > 10dB |
| NOTE 1: If a multi-column or multi-band antenna is used the column closest to the AAS BS shall be selected while other columns are terminated during testing.  NOTE 2: The vertical radiating dimension definition shall be used instead of the vertical beam width definition when the test chamber dimensions limit the use of vertical beam width definition. Otherwise the vertical beam width definition shall be used.  NOTE 3: For BS type 1-O with dual polarization the CLTA has two conducted interfaces each representing one polarization  NOTE 4: Matched to the polarization of EUT antenna | | |

**<Next change>**

5.2 Test configurations for AAS BS for operating bands where MSR with more than 1 RAT is supported

**Table 5.2-1: Test configuration applicability to requirements  
and capability sets for AAS BS supporting MSR operation**

| **Test case** | | **UTRA + E-UTRA (RCSA 3)** | | | **E-UTRA + NR (RCSA 3A)** | | | **UTRA + E-UTRA + NR (RCSA 3B)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **BC1** | **BC2** | **BC3** | **BC1** | **BC2** | **BC3** | **BC1, BC2** |
| 6.2 | Radiated transmit power | C: ATCR3a  CNC: ATCR3a C/NC: ATCR3a, ANTCR3 | C: ATCR3a  CNC: ATCR3a C/NC: ATCR3a, ANTCR3 | C: ATCR3b | C: ATCR7  CNC: ATCR7  C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ATCR9  C/NC: ATCR9, ANTCR9 |
| 6.3 | OTA Base Station output power | - | - | - | - | - | - | - |
| 6.3.2 | OTA Maximum output power | C: ATCR3a CNC: ATCR3a C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ATCR3a C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ATCR9  C/NC: ATCR9, ANTCR9 |
| 6.3.3 | OTA E-UTRA DL RS power | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Subclause 5.3.4 |
| 6.4 | OTA Output power dynamics | - | - | - | - | - | - | - |
|  | E-UTRA | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Subclause 5.3.4 |
|  | UTRA FDD | Clause 5.3.3 | Clause 5.3.3 | N/A | N/A | N/A | N/A | Subclause 5.3.3 |
|  | NR – RE power control dynamic range | N/A | N/A | N/A | Tested with Error Vector Magnitude | Tested with Error Vector Magnitude | Tested with Error Vector Magnitude | Tested with Error Vector Magnitude |
|  | NR – total power dynamic range | N/A | N/A | N/A | SC | SC | SC | SC |
| 6.5 | OTA Transmit ON/OFF power | - | - | - | - | - | - | - |
| 6.5.1 | OTA Transmitter OFF power | N/A | N/A | N/A | N/A | N/A | C: ATCR7  CNC: ATCR7 C/NC: ATCR7, ANTCR7 | N/A |
| 6.5.2 | OTA Transmitter transient period | N/A | N/A | N/A | N/A | N/A | C: ATCR7 CNC: ATCR7 C/NC: ATCR7, ANTCR7 | N/A |
| 6.6 | Transmitted signal quality | - | - | - | - | - | - | - |
| 6.6.2 | OTA Frequency error | - | - | - | - | - | - | - |
|  | E-UTRA | Same TC as used in clause 6.6.4 | Same TC as used in clause 6.6.4 | Same TC as used in clause 6.6.4 | Same TC as used in clause 6.6.4 | Same TC as used in clause 6.6.4 | Same TC as used in clause 6.6.4 | Same TC as used in subclause 6.6.4 |
|  | UTRA FDD | Same TC as used in clause 6. 6.4 | Same TC as used in clause 6. 6.4 | N/A | N/A | N/A | N/A | Same TC as used in subclause 6.6.4 |
| NR | NR | N/A | N/A |  | Same TC as used in clause 6.6.4 | Same TC as used in clause 6.6.4 | Same TC as used in clause 6.6.4 | Same TC as used in subclause 6.6.4 |
| 6.6.3 | OTA Time alignment error | - | - | - | - | - | - | - |
|  | E-UTRA | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Subclause 5.3.4 |
|  | UTRA FDD | Clause 5.3.3 | Clause 5.3.3 | N/A | N/A | N/A | N/A | Subclause 5.3.3 |
|  | NR | N/A | N/A | N/A | C: ATCR8  CNC: ATCR8  C/NC: ATCR8, ANTCR8 | C: ATCR8  CNC: ATCR8  C/NC: ATCR8, ANTCR8 | C: ATCR8  CNC: ATCR8  C/NC: ATCR8, ANTCR8 | C: ATCR9  CNC: ATCR9  C/NC: ATCR9, ANTCR9 |
| 6.6.4 | OTA Modulation quality - EVM | - | - | - | - | - | - | - |
|  | E-UTRA | C: ATCR3a CNC: ATCR3a C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ATCR3a C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ATCR9  C/NC: ATCR9, ANTCR9 |
|  | UTRA FDD | C: ATCR3a CNC: ATCR3a C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ATCR3a C/NC: ATCR3a, ANTCR3 | N/A | N/A | N/A | N/A | C: ATCR9  CNC: ATCR9  C/NC: ATCR9, ANTCR9 |
|  | NR | N/A | N/A | N/A | N/A | C: ATCR7 CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ATCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ATCR9  C/NC: ATCR9, ANTCR9 |
| 6.7 | OTA Unwanted Emissions | - | - | - | - | - | - | - |
| 6.7.2 | OTA Occupied bandwidth | - | - | - | - | - | - | - |
|  | Minimum requirement | Clause 5.3.3 Clause 5.3.4 | Clause 5.3.3 Clause 5.3.4 | Clause 5.3.3 Clause 5.3.4 | Clause 5.3.4  SC, ATCR8b (Note) | Clause 5.3.4  SC, ATCR8b (Note) | Clause 5.3.4  SC, ATCR8b (Note) | Subclause 5.3.3  Subclause 5.3.4  SC |
| 6.7.3 | OTA Adjacent Channel Leakage power Ratio | - | - | - | - | - | - | - |
|  | E-UTRA | C: ATCR2a CNC: ANTCR2 C/NC:ATCR2a, ANTCR2 | C: ATCR2a CNC: ANTCR2 C/NC:ATCR2a, ANTCR2 | C: ATCR2a CNC: ANTCR2 C/NC:ATCR2a, ANTCR2 | C: ATCR2a CNC: ANTCR2 C/NC:ATCR2a, ANTCR2 | C: ATCR2a CNC: ANTCR2 C/NC:ATCR2a, ANTCR2 | C: ATCR2a CNC: ANTCR2 C/NC:ATCR2a, ANTCR2 | C: ATCR9  CNC: ATCR9  C/NC: ATCR9, ANTCR9 |
|  | UTRA FDD | Clause 5.3.3 | Clause 5.3.3 | N/A | N/A | N/A | N/A | Subclause 5.3.3 |
|  | NR | N/A | N/A | N/A | C: ATCR8a  CNC: ANTCR8  C/NC: ATCR8a, ANTCR8 | C: ATCR8a  CNC: ANTCR8  C/NC: ATCR8a, ANTCR8 | C: ATCR8a  CNC: ANTCR8  C/NC: ATCR8a, ANTCR8 | C: ATCR9  CNC: ATCR9  C/NC: ATCR9, ANTCR9 |
|  | Cumulative ACLR | CNC: ANTCR3 C/NC:ANTCR3 | CNC: ANTCR3 C/NC:ANTCR3 |  | CNC: ANTCR7 C/NC:ANTCR7 | CNC: ANTCR7 C/NC:ANTCR7 | CNC: ANTCR7 C/NC:ANTCR7 | CNC: ANTCR9  C/NC: ANTCR9 |
| 6.6.5 | OTA Operating band unwanted emission | - | - | - | - | - | - | - |
|  | General requirement for Band Categories 1 and 3 | Clause 5.3.3 Clause 5.3.4 C: ATCR3a CNC: ATCR3a, ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | Clause 5.3.3 Clause 5.3.4 | Clause 5.3.4  C: ATCR7 CNC: ATCR7, ANTCR7  C/NC: ATCR7, ANTCR7 | N/A | Clause 5.3.4  C: ATCR7  CNC: ATCR7, ANTCR7  C/NC: ATCR7, ANTCR7 | Subclause 5.3.3 Subclause 5.3.4 |
|  | General requirement for Band Category 2 | N/A | Clause 5.3.3 Clause 5.3.4  C: ATCR3a CNC: ATCR3a, ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | N/A | Clause 5.3.4  C: ATCR7 CNC: ATCR7, ANTCR7  C/NC: ATCR7, ANTCR7 | N/A | BC1: N/A  BC2:  Subclause 5.3.3  Subclause 5.3.4  C: ATCR9  CNC: ATCR9, ANTCR9  C/NC: ATCR9, ANTCR9 |
|  | Additional requirements | (note 1) | (note 1) | (note 1) | (note 1) | (note 1) | (note 1) | (note 1) |
| 6.7.6 | OTA Spurious emission | - | - | - | - | - | - | - |
|  | (Category A) | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
|  | (Category B) | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
|  | Protection of the BS receiver of own or different BS | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
|  | Additional spurious emissions requirements | C: ATCR3a, CNC: ANTCR3 C/NC: ATCR3a, ATCR3a | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7, CNC: ANTCR7, C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
|  | Co-location with other Base Stations | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
| 6.8 | OTA Transmitter intermodulation | - | - | - | - | - | - | - |
|  | General requirement | Same TC as used in clause 6.7 | Same TC as used in clause 6.7 | Same TC as used in clause 6.7 | Same TC as used in clause 6.7 | Same TC as used in clause 6.7 | Same TC as used in clause 6.7 | Same TC as used in subclause 6.7 |
|  | Additional requirement (BC1 and BC2) | CNC: ANTCR3 C/NC:ANTCR3 | Same TC as used in clause 6.7 | N/A | CNC: ANTCR7 C/NC:ANTCR7a | Same TC as used in clause 6.7 | N/A | BC1:  CNC: ANTCR9 C/NC:ANTCR9  BC2:  Same TC as used in subclause 6.7 |
|  | Additional requirement (BC3) | N/A | N/A | Same TC as used in clause 6.7 | N/A | N/A | N/A | N/A |
| 7.2 | OTA sensitivity | - | - | - | - | - | - | - |
|  | E-UTRA requirement | clause 5.3.4 | clause 5.3.4 | clause 5.3.4 | clause 5.3.4 | clause 5.3.4 | clause 5.3.4 | subclause 5.3.4 |
|  | UTRA FDD requirement | clause 5.3.3 | clause 5.3.3 | N/A | N/A | N/A | N/A | subclause 5.3.3 |
|  | UTRA TDD requirement | N/A | N/A | clause 5.3.3 | N/A | N/A | N/A | N/A |
|  | NR requirement | N/A | N/A | N/A | ATCR4d | ATRC4d | ATCR4d | ATCR4d |
| 7.3 | OTA reference sensitivity level | - | - | - | - | - | - | - |
|  | E-UTRA requirement | clause 5.3.4 | clause 5.3.4 | clause 5.3.4 | clause 5.3.4 | clause 5.3.4 | clause 5.3.4 | subclause 5.3.4 |
|  | UTRA FDD requirement | clause 5.3.3 | clause 5.3.3 | N/A | N/A | N/A | N/A | subclause 5.3.3 |
|  | NR requirement | N/A | N/A | N/A | ATRC4d | ATCR4d | ATCR4d | ATCR4d |
| 7.4 | OTA Dynamic range | - | - | - | - | - | - | - |
|  | E-UTRA | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Subclause 5.3.4 |
|  | UTRA FDD | Clause 5.3.3 | Clause 5.3.3 | N/A | N/A | N/A | N/A | Subclause 5.3.3 |
|  | NR | N/A | N/A | N/A | ATCR4d | ATCR4d | ATCR4d | ATCR4d |
| 7.5 | OTA Adjacent channel selectivity and narrowband blocking | - | - | - | - | - | - | - |
|  | General blocking requirement | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
|  | General narrowband blocking requirement | C: ATCR3a, ATCR4b CNC:ANTCR3, ATCR4b C/NC: ATCR3a, ANTCR3,ATCR4b | C: ATCR3a, ATCR4b CNC:ANTCR3, ATCR4b C/NC: ATCR3a, ANTCR3,ATCR4b | C: ATCR4b | C: ATCR7, ATCR4b, ATCR4d CNC:ANTCR7, ATCR4b, ATCR4d  C/NC: ATCR7, ANTCR7,ATCR4b, ATCR4d | C: ATCR7, ATCR4b, ATCR4d CNC:ANTCR7, ATCR4b, ATCR4d  C/NC: ATCR7, ANTCR7,ATCR4b, ATCR4d | C: ATCR7, ATCR4b, ATCR4d  CNC: ANTCR7, ATCR4b, ATCR4d C/NC: ATCR7, ANTCR7, ATCR4b, ATCR4d | C:  ATCR9, ATCR4a, ATCR4b, ATCR4d  CNC:  ANTCR9, ATCR4a, ATCR4b, ATCR4d  C/NC:  ATCR9,  ANTCR9, ATCR4a, ATCR4b, ATCR4d |
|  | Additional BC3 blocking minimum requirement | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7.6 | OTA Blocking | - | - | - | - | - | - | - |
|  | General requirement | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
|  | Co-location requirement | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
| 7.7 | OTA Receiver spurious emissions | - | - | - | - | - | - | - |
|  | General requirement | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
|  | Additional requirement for BC2 (Category B) | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7.8 | OTA Receiver intermodulation | - | - | - | - | - | - | - |
|  | General intermodulation requirement | C: ATCR3a CNC: ANTCR3 C/NC: ATCR3a, ANTCR3 | C: ATCR3a CNC ANTCR3 C/NC: ATCR3a, ANTCR3 | N/A | C: ATCR7 CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR7  CNC: ANTCR7 C/NC: ATCR7, ANTCR7 | C: ATCR9  CNC: ANTCR9  C/NC: ATCR9, ANTCR9 |
|  | General narrowband intermodulation requirement | C: ATCR3a, ATCR4b CNC:ANTCR3, ATCR4b C/NC: ATCR3a, ANTCR3, ATCR4b | C: ATCR3a ATCR4b CNC:ANTCR3,ATCR4b C/NC: ATCR3a, ANTCR3; ATCR4b | C: ATCR4b | C: ATCR7, ATCR4b, ATCR4d CNC:ANTCR7, ATCR4b, ATCR4d  C/NC: ATCR7, ANTCR7, ATCR4b, ATCR4d | C: ATCR7 ATCR4b, ATCR4d CNC:ANTCR7,ATCR4b, ATCR4d  C/NC: ATCR7, ANTCR7; ATCR4b, ATCR4d | C: ATCR7, ATCR4b, ATCR4d CNC: ANTCR7, ATCR4b, ATCR4d C/NC: ATCR7, ANTCR7, ATCR4b, ATCR4d | C:  ATCR9, ATCR4a, ATCR4b, ATCR4d  CNC:  ANTCR9, ATCR4a, ATCR4b, ATCR4d  C/NC:  ATCR9,  ANTCR9, ATCR4a, ATCR4b, ATCR4d |
| 7.9 | OTA In-channel selectivity | - | - | - | - | - | - | - |
|  | E-UTRA requirement | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Clause 5.3.4 | Subclause 5.3.4 |
|  | NR requirement | N/A | N/A | N/A | ATCR4d | ATCR4d | ATCR4d | ATCR4d |
| NOTE 1: ATCR8b is only applicable when contiguous CA is supported.  NOTE 2: For Operating band unwanted emissions, NR shall also be tested with SC with widest supported channel bandwidth and highest supported sub-carrier spacing. | | | | | | | | |

**<Next change>**

##### 6.7.3.4.2 Procedure

6.7.3.4.2.1 General Procedure

The following procedure for measuring TRP is based on the directional power measurements as described in in Annex F. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 6 and 9.

1) Place the AAS BS at the positioner.

2) Align the manufacturer declared coordinate system orientation (see table 4.10-1, D9.2) of the AAS BS with the test system.

3) The measurement devices characteristics shall be:

- measurement filter bandwidth: defined in clause 6.7.3.5.

- detection mode: true RMS voltage or true power averaging.

The emission power should be averaged over an appropriate time duration to ensure the measurement is within the measurement uncertainty in Table 4.1.2.2-1.

4) For single carrier operation, set the AAS BS to transmit according to the applicable test configuration in clause 5 using the corresponding test model(s) in clause 4.12.2 at manufacturers declared *rated carrier TRP* (Prated,c,TRP).

For an AAS BS declared to be capable of multi-carrier and/or CA operation use the applicable test signal configuration and corresponding power setting specified in clause 4.11.

5) Orient the positioner (and BS) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex F).

6) Measure the absolute total power of the assigned channel frequency and the (adjacent channel frequency)

7) Repeat step 6-7 for all directions in the appropriated TRP measurement grid needed for TRPEstimate for each of the assigned channel frequency and the adjacent channel frequency (see Annex F).

8) Calculate TRPEstimate for the absolute total radiated power of the wanted channel and the adjacent channel and the ACLR estimate using the measurements made in Step 7.

9) Calculate relative ACLR estimate.

NOTE 1: ACLR is calculated by the ratio of the absolute TRP of the assigned channel frequency and the absolute TRP of the adjacent frequency channel.

NOTE 2: For FR1 the measurement uncertainty of the reverberation chamber for the relative ACLR is higher than the measurement uncertainty in clause 4.1.2 the test requirements in Table 6.7.3.5.1-1 shall be tightened following the procedure in clause 4.1.3.

**<Next change>**

##### 6.7.4.4.2 Procedure

The following procedure for measuring TRP is based on the directional power measurements as described in in Annex F. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 5, 7 and 10.

1) Place the AAS BS at the positioner.

2) Align the manufacturer declared coordinate system orientation (see table 4.10-1, D9.2) of the AAS BS with the test system.

3) The measurement devices characteristics shall be:

- a 30 kHz measurement bandwidth.

- Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4.0 MHz shall use Measurements with an offset from the carrier centre frequency between 4.0 MHz and (f\_offsetmax - 500 kHz) shall use a 1 MHz measurement bandwidth.

- detection mode: true RMS voltage or true power averaging.

The emission power should be averaged over an appropriate time duration to ensure the measurement is within the measurement uncertainty in Table 4.1.2.2-1.

As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity, efficiency and avoiding e.g. carrier leakage, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

4) For single carrier operation, set the AAS BS to transmit according to the applicable test configuration in clause 5 using the corresponding test model(s) in clause 4.12.2 at manufacturers declared *rated carrier TRP* (Prated,c,TRP).

For an AAS BS declared to be capable of multi-carrier and/or CA operation use the applicable test signal configuration and corresponding power setting specified in clause 4.11.

5) For UTRA FDD *multi-band RIB* or *RIB* operating in non-contiguous spectrum, the emission within the Inter RF Bandwidth or sub-block gap shall be measured using the specified measurement bandwidth from the closest *Base Station RF Bandwidth* or sub block edge.

6) Orient the positioner (and BS) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex F).

7) Sweep the centre frequency of the measurement filter in contiguous steps and measure emission power within the specified frequency ranges with the specified measurement bandwidth.

8) Repeat step 6-7 for all directions in the appropriated TRP measurement grid needed for TRPEstimate (see Annex F).

9) Calculate TRPEstimate using the measurements made in Step 7.

In addition, for *multi-band RIB*, the following steps shall apply:

10) For *multi-band RIB* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

**<Next change>**

##### 6.7.5.4.2 Procedure

The following procedure for measuring TRP is based on the directional power measurements as described in Annex F. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 6, 9 and 10.

1) Place the AAS BS at the positioner.

2) Align the manufacturer declared coordinate system orientation (see table 4.10-1, D9.2) of the AAS BS with the test system.

3) The measurement devices characteristics shall be:

- detection mode: true RMS voltage or true power averaging.

The emission power should be averaged over an appropriate time duration to ensure the measurement is within the measurement uncertainty in Table 4.1.2.2-1.

4) Set the AAS BS to transmit:

a) For MSR:

- Set the AAS BS to transmit maximum power according to the applicable test configuration in clause 5 using the corresponding test models or set of physical channels in clause 4.12.

b) For E-UTRA:

*-* AAS BS declared to be capable of single carrier operation only, set the AAS BS to transmit a signal according to E-TM1.1 (clause 4.12.2) at manufacturer's declared *rated carrier TRP* (Prated,c,TRP).

- For an AAS BS declared to be capable of multi-carrier and/or CA operation, set the set the AAS BS to transmit according to E-TM1.1 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.11.

5) Orient the positioner (and BS) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex F).

6) Sweep the centre frequency of the measurement filter in contiguous steps and measure emission power within the specified frequency ranges with the specified measurement bandwidth.

7) Repeat step 6-7 for all directions in the appropriated TRP measurement grid needed for TRPEstimate (see annex F).

8) Calculate TRPEstimate using the measurements made in Step 7.

9) Repeat the test for the remaining test cases:

a) For MSR with channel set-up according to clause 5 and clause 4.12.2.

b) For E-UTRA with the channel set-up according to E-TM 1.2

In addition, for *multi-band RIB*, the following steps shall apply:

10) For *multi-band RIB* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

**<Next change>**

6.7.6.2.4.2 Procedure

The following procedure for measuring TRP is based on the directional power measurements as described in in Annex F. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 5, 7 and 10.

1) Place the AAS BS at the positioner.

2) Align the manufacturer declared coordinate system orientation (see table 4.10-1, D9.2) of the AAS BS with the test system.

3) Measurements shall use a measurement bandwidth in accordance to the conditions in clause 6.7.6.2.5.

4) The measurement device characteristics shall be:

- Detection mode: True RMS.

The emission power should be averaged over an appropriate time duration to ensure the measurement is within the measurement uncertainty in Table 4.1.2.2-1.

5) Set the AAS BS to transmit

a) For MSR:

- Set the RIB to transmit maximum power according to the applicable test configuration in clause 5 using the corresponding test models or set of physical channels in clause 4.11.

b) For UTRA:

- For a RIB declared to be capable of single carrier operation only, set the RIB to transmit a signal according to TM1, clause 4.12.2, at the manufacturer's declared rated carrier TRP, Prated,c,TRP.

- For a RIB declared to be capable of multi-carrier operation, set the set the RIB to transmit according to TM1 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.11.

c) For E-UTRA:

*-* RIBdeclared to be capable of single carrier operation only, set the RIB to transmit a signal according to E-TM1.1 in clause 4.12.2, at manufacturer's declared rated carrier TRP, Prated,c,TRP.

- For a RIB declared to be capable of multi-carrier and/or CA operation, set the set the RIB to transmit according to E-TM1.1 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.11.

6) Orient the positioner (and BS) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex F).

7) Measure the emission at the specified frequencies with specified measurement bandwidth

8) Repeat step 6-7 for all directions in the appropriated TRP measurement grid needed for full TRP estimation (see annex F).

NOTE 1: The TRP measurement grid may not be the same for all measurement frequencies.

NOTE 2: The frequency sweep or the TRP measurement grid sweep may be done in any order

9) Calculate TRP at each specified frequency using the directional measurements.

In addition, for *multi-band RIB(s)*, the following steps shall apply:

10) For *multi-band RIBs* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

**<Next change>**

6.7.6.3.4.2 Procedure

1) Select a CLTA according to parameters given in Table 4.15.2.2-1 and place the CLTA according to parameters given in Table 4.15.2.3-1.

2) Several CLTAs are required to cover the whole co-location spurious emission frequency ranges.

3) The test antenna shall be dual (or single) polarized with the same frequency range as the *AAS BS* for co-location spurious emission test case.

4) Connect test antenna and CLTA to the measurement equipment as depicted in Annex D1.4.

5) OTA co-location spurious emission is measured at the CLTA conducted output(s).

6) The measurement device (signal analyzer) characteristics shall be:

- Detection mode: True RMS.

The emission power should be averaged over an appropriate time duration to ensure the measurement is within the measurement uncertainty in Table 4.1.2.2-1.

7) Set the *AAS BS* to transmit:

a) For MSR:

- Set the *AAS BS* to transmit maximum power, according to the applicable test configuration in clause 5 using the corresponding test models or set of physical channels in clause 4.11.

b) For UTRA FDD:

- For a *AAS BS* declared to be capable of single carrier operation only, set the *AAS BS* to transmit full maximum power according to TM1, clause 4.12.2, at the manufacturer's declared rated carrier TRP, Prated,c,TRP.

- For a *AAS BS* declared to be capable of multi-carrier operation, set the *AAS BS* to transmit maximum power according to TM1 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.11.

c) For E-UTRA:

*-* For *AAS BS* declared to be capable of single carrier operation only, set the *AAS BS* to transmit maximum power according to E-TM1.1 in clause 4.12.2, at manufacturer's declared rated carrier TRP, Prated,c,TRP.

- For a *AAS BS* declared to be capable of multi-carrier and/or CA operation, set the *AAS BS* to transmit maximum power according to E-TM1.1 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.11.

8) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the test requirement in clause 6.7.6.5.

NOTE: An alternative measurement method to be used for measuring the OTA emission is described in Annex H.

In addition, for *multi-band RIB*, the following steps shall apply:

9) For *multi-band RIB* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

**<Next change>**

6.7.6.4.4.2 Procedure

The following procedure for measuring TRP is based on the directional power measurements as described in in Annex F. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 5, 7 and 10.

1) Place the AAS BS at the positioner.

2) Align the manufacturer declared coordinate system orientation (see table 4.10-1, D9.2) of the AAS BS with the test system.

3) Measurements shall use a measurement bandwidth in accordance to the conditions in TS 37.104 [5] clause 6.6.1.

4) The measurement device characteristics shall be:

- Detection mode: True RMS.

The emission power should be averaged over an appropriate time duration to ensure the measurement is within the measurement uncertainty in Table 4.1.2.2-1.

5) Set the AAS BS to transmit

a) For MSR:

- Set the RIB to transmit maximum power according to the applicable test configuration in clause 5 using the corresponding test models or set of physical channels in clause 4.11.

b) For UTRA:

- For a RIB declared to be capable of single carrier operation only, set the RIB to transmit a signal according to TM1, clause 4.12.2, at the manufacturer's declared rated carrier TRP, Prated,c,TRP.

- For a RIB declared to be capable of multi-carrier operation, set the set the RIB to transmit according to TM1 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.11.

c) For E-UTRA:

*-* RIBdeclared to be capable of single carrier operation only, set the RIB to transmit a signal according to E-TM1.1 in clause 4.12.2, at manufacturer's declared rated carrier TRP Prated,c,TRP.

- For a RIB declared to be capable of multi-carrier and/or CA operation, set the set the RIB to transmit according to E-TM1.1 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.11.

6) Orient the positioner (and BS) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex F).

7) Measure the emission at the specified frequencies with specified measurement bandwidth

8) Repeat step 6-7 for all directions in the appropriated TRP measurement grid needed for full TRP estimation (see annex F).

NOTE 1: The TRP measurement grid may not be the same for all measurement frequencies.

NOTE 2: The frequency sweep or the TRP measurement grid sweep may be done in any order

9) Calculate TRP at each specified frequency using the directional measurements.

In addition, for *multi-band RIB(s)*, the following steps shall apply:

10) For *multi-band RIBs* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

**<Next change>**

#### 6.8.4.2 Procedure

1) Select a CLTA according to parameters given in Table 4.15.2.2-1.

2) Place the CLTA according to parameters given in Table 4.15.2.3-1.

3) The test antenna(s) shall be dual (or single) polarized covering the same frequency range as the *AAS BS* and the emission frequencies.

4) Several test antennas are required to cover both the *AAS BS* and the whole emission frequency range.

5) Connect the test antenna and CLTA to the measurement equipment as shown in Annex D1.5, Figures D.1.5-1.

6) During the OTA emission measurements at the test antenna conducted output(s), both *AAS BS* and CLTA are rotated around same axis.

7) The OTA unwanted emissions measurement method shall be TRP, according to the procedure described in Annex F.

8) The measurement device (signal analyzer) characteristics shall be:

- Detection mode: True RMS.

The emission power should be averaged over an appropriate time duration to ensure the measurement is within the measurement uncertainty in Table 4.1.2.2-1.

9) Set the *AAS BS* to transmit:

a) For MSR:

- Set the *AAS BS* to transmit maximum power according to the applicable test configuration in clause 5 using the corresponding test models or set of physical channels in clause 4.11.

b) For UTRA FDD:

- For a *AAS BS* declared to be capable of single carrier operation only, set the *AAS BS* to transmit maximum power according to TM1, clause 4.12.2, at the manufacturer's declared rated carrier TRP, Prated,c,TRP.

- For a *AAS BS* declared to be capable of multi-carrier operation, set the *AAS BS* to transmit maximum power according to TM1 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.11.

c) For E-UTRA:

*-* For *AAS BS* declared to be capable of single carrier operation only, set the *AAS BS* to transmit maximum power according to E-TM1.1 in clause 4.12.2, at manufacturer's declared rated carrier TRP, Prated,c,TRP.

- For a *AAS BS* declared to be capable of multi-carrier and/or CA operation, set the *AAS BS* to transmit maximum power according to E-TM1.1 on all carriers configured using the applicable test configuration and corresponding power setting specified in clause 4.11.

10) Generate the interfering signal:

a) For MSR:

- using E-TM1.1 as defined in clause 4.12.2, with 5 MHz channel bandwidth, at a centre frequency offset according to the conditions in table 6.8.5.1.1-1, but exclude interfering frequencies that are outside of the allocated downlink operating band or interfering frequencies that are not completely within the sub-block gap or within the *Inter RF Bandwidth gap*.

b) For UTRA FDD:

- in accordance to TM1, clause 4.12.2 with a frequency offset according to the conditions of table 6.8.5.2.1-1, but exclude interfering signal frequencies that are outside of the allocated downlink operating band or interfering signal frequencies that are not completely within the sub-block gap or within the *Inter RF Bandwidth gap*.

c) For E-UTRA:

- according to E-TM1.1, as defined in clause 4.12.2, with 5 MHz channel bandwidth and a centre frequency offset according to the conditions of table 6.8.5.3.1-1, but exclude interfering frequencies that are outside of the allocated downlink operating band or interfering frequencies that are not completely within the sub-block gap or within the *Inter RF Bandwidth gap*.

11) Connect the interfering signal to the CLTA input interfaces, equally dividing the power among supported polarizations. Adjust the interfering signal level at the CLTA conducted input(s) as defined in:

a) For MSR:

i. General co-location table 6.8.5.1.1-1.

ii. Additional co-location (BC1 and BC2) table 6.8.5.1.2-1.

iii. Additional co-location (BC3) table 6.8.5.1.3-1.

b) For UTRA FDD:

i. General co-location table 6.8.5.2.1-1 .

c) For E-UTRA:

i. General co-location table 6.8.5.3.1-1.

ii. Void

12) If the interfering signal is applicable according to clause 5, perform the unwanted emission tests specified in clauses 6.7.3 (OTA ACLR), 6.7.4 (OTA spectrum mask) and 6.7.5 (OTA OBUE), for all third and fifth order intermodulation products which appear in the frequency ranges defined in clauses 6.7.3, 6.7.4 and 6.7.5 (NOTE 2). The width of the intermodulation products shall be taken into account.

13) If the interfering signal is applicable according to clause 5, perform the transmitter spurious emissions test as specified in clause 6.7.6 (OTA spurious emission), except OTA co-location spurious emission, for all third and fifth order intermodulation products which appear in the frequency ranges defined in clause 6.7.6 (NOTE 2). The width of the intermodulation products shall be taken into account.

14) Verify that the emission level does not exceed the required level in clause 6.8.5 (Test requirements) with the exception of interfering signal frequencies.

15) Repeat the test for the remaining interfering signal centre frequency offsets according to the conditions of:

a) For MSR:

i. General co-location table 6.8.5.1.1-1.

ii. Additional co-location (BC1 and BC2) table 6.8.5.1.2-1.

iii. Additional co-location (BC3) table 6.8.5.1.3-1.

b) For UTRA FDD:

i. General co-location table 6.8.5.2.1-1 .

c) For E-UTRA:

i. General co-location table 6.8.5.3.1-1.

ii. Void

16) Repeat the test for the remaining interfering signals defined in clause 5 for requirements 6.7.3 (OTA ACLR), 6.7.4 (OTA spectrum mask), 6.7.5 (OTA OBUE) and 6.7.6 (OTA spurious emission), except OTA co-location spurious emission.

In addition, for *multi-band AAS BS,* the following steps shall apply:

17) For *multi-band AAS BS* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

NOTE 1: The third order intermodulation products are centred at 2F1±F2 and 2F2±F1. The fifth order intermodulation products are centred at 3F1±2F2, 3F2±2F1, 4F1±F2, and 4F2±F1 where F1 represents the test signal centre frequency or centre frequency of each sub-block and F2 represents the interfering signal centre frequency. The widths of intermodulation products are:

- (n\*BWF1 + m\*BWF2) for the nF1±mF2 products;

- (n\*BWF2 + m\*BWF1) for the nF2±mF1 products;

where BWF1 represents the test signal RF bandwidth or channel bandwidth in case of single carrier, or sub-block bandwidth, and BWF2 represents the interfering signal bandwidth.

NOTE 2: During the conformance test the interfering signal can be applied on one side of the wanted signal, while the transmitter intermodulation emission is measured only on the opposite side of the wanted signal. This applies for intermodulation products which are within the operating band or OBUE region.

### 6.8.5 Test Requirement

#### 6.8.5.1 MSR test requirements

##### 6.8.5.1.1 General test requirement

In the frequency range relevant for this test the transmitter intermodulation level shall not exceed the unwanted emission limits specified for transmitter spurious emission in clause 6.7.6 (except co-location spurious emission), operating band unwanted emission in clause 6.7.5 and ACLR in clause 6.7.3 in the presence of a wanted signal and an interfering signal according to table 6.8.5.1.1-1 for an *OTA AAS BS* operating in BC1, BC2 and BC3.

The requirement is applicable outside the edges of the *Base Station RF Bandwidth*. The interfering signal offset is defined relative to the *Base Station RF Bandwidth edges* or *radio bandwidth* edges.

For *RIB* supporting operation in *non-contiguous spectrum*, the requirement is also applicable inside a *sub-block gap* for interfering signal offsets where the interfering signal falls completely within the *sub-block gap*. The interfering signal offset is defined relative to the *sub-block* edges.

For *multi-band RIBs*, the requirement applies relative to the *Base Station RF Bandwidth edges* of each operating band. In case the inter *Base Station RF Bandwidth* gap is less than 15 MHz, the requirement in the gap applies only for interfering signal offsets where the interfering signal falls completely within the inter *Base Station RF Bandwidth* gap.

Table 6.8.5.1.1-1: Interfering and wanted signals for the OTA transmitter intermodulation requirement

| Parameter | Value |
| --- | --- |
| Wanted signal type | E-UTRA or NR signal |
| Interfering signal type | E-UTRA signal of *channel bandwidth* 5 MHz |
| Interfering signal power level applied to the CLTA | min(46 dBm, Prated,t,TRP) |
| Interfering signal centre frequency offset from *Base Station RF Bandwidth* edge or edge of *sub-block* inside a gap | ±2.5 MHz  ±7.5 MHz  ±12.5 MHz |
| NOTE 1: Interfering signal positions that are partially or completely outside of any *downlink operating band* of the RIB is excluded from the requirement, unless the interfering signal positions fall within the frequency range of adjacent *downlink operating band*s in the same geographical area. In case that none of the interfering signal positions fall completely within the frequency range of the *downlink operating band*, TS 37.141 provides further guidance regarding appropriate test requirements.  NOTE 2: In certain regions, NOTE 1 is not applied in Band 1, 3, 8, 9, 11, 18, 19, 21, 28, 32 operating within 1 475.9 MHz to 1 495.9 MHz, 34.  NOTE 3: For *OTA AAS BS* with dual polarization, the interfering signal power shall be equally divided between the supported polarizations at the CLTA. | |

##### 6.8.5.1.2 Additional test requirement (BC1 and BC2)

In the frequency range relevant for this test the transmitter intermodulation level shall not exceed the unwanted emission limits specified for transmitter spurious emission in clause 6.7.6 (except co-location spurious emission), operating band unwanted emission in clause 6.7.5 and ACLR in clause 6.7.3 in the presence of a wanted signal and an interfering signal according to table 6.8.5.1.2-1 for an *OTA AAS BS* operating in BC2.

The requirement is applicable outside the edges of the *Base Station RF Bandwidth* for BC2. The interfering signal offset is defined relative to the *Base Station RF Bandwidth edges*.

For *RIBs* supporting operation in *non-contiguous spectrum* in BC1 or BC2, the requirement is also applicable inside a *sub-block gap* with a gap size larger than or equal to two times the interfering signal centre frequency offset. For *RIBs* supporting operation in *non-contiguous spectrum* in BC1, the requirement is not applicable inside a *sub-block gap* with a gap size equal to or larger than 5 MHz. The interfering signal offset is defined relative to the *sub-block* edges.

For *multi-band RIBs*, the requirement applies relative to the *Base Station RF Bandwidth edges* of a BC2 operating band. The requirement is also applicable for BC1 and BC2 inside an inter *Base Station RF Bandwidth* gap equal to or larger than two times the interfering signal centre frequency offset. For *RIBs* supporting operation in multiple operating bands, the requirement is not applicable for BC1 band inside an inter *Base Station RF Bandwidth* gap with a gap size equal to or larger than 5 MHz.

Table 6.8.5.1.2-1: Interfering and wanted signals for the OTA transmitter intermodulation requirement

| Parameter | Value |
| --- | --- |
| Wanted signal type | E-UTRA and/or NR UTRA signal |
| Interfering signal type | CW |
| Interfering signal power level applied to the CLTA | min(46 dBm, Prated,t,TRP)) |
| Interfering signal centre frequency offset from *Base Station RF Bandwidth* edge or edge of *sub-block* inside a gap | > abs(800) kHz for CW interfering signal |
| NOTE 1: Interfering signal positions that are partially or completely outside of any *downlink operating band* of the RIB are excluded from the requirement.  NOTE 2: For *OTA AAS BS* with dual polarization, the interfering signal power shall be equally divided between the supported polarizations at the CLTA. | |

##### 6.8.5.1.3 Additional test requirement (BC3)

In the frequency range relevant for this test, the transmitter intermodulation level shall not exceed the unwanted emission limits specified for transmitter spurious emission in clause 6.7.6 (except co-location spurious emission), operating band unwanted emission in clause 6.7.5 and ACLR in clause 6.7.3 in the presence of a wanted signal and an interfering signal according table 6.8.5.1.3-1 an *OTA AAS BS* operating in BC3.

For *multi-band RIBs*, the requirement applies relative to *the Base Station RF Bandwidth edges* of each operating band. In case the *Inter RF Bandwidth gap* is less than 3.2 MHz, the requirement in the gap applies only for interfering signal offsets where the interfering signal falls completely within the inter *Base Station RF Bandwidth* gap.

Table 6.8.5.1.3-1: Interfering and wanted signals for the OTA transmitter intermodulation requirement (BC3)

| Parameter | Value |
| --- | --- |
| Wanted signal type | E-UTRA and/or UTRA and/or NR signal |
| Interfering signal type | 1,28 Mcps UTRA TDD signal of *channel bandwidth* 1,6 MHz |
| Interfering signal power level applied to the CLTA | min(46 dBm, Prated,t,TRP) |
| Interfering signal centre frequency offset from *Base Station RF Bandwidth* edge or edge of *sub-block* inside a gap | ±0,8 MHz  ±1,6 MHz  ±2,4 MHz |
| NOTE 1: Interfering signal positions that are partially or completely outside of any *downlink operating band* of the base station are excluded from the requirement.  NOTE 2: For *OTA AAS BS* with dual polarization, the interfering signal power shall be equally divided between the supported polarizations at the CLTA. | |

#### 6.8.5.2 Single RAT UTRA operation

##### 6.8.5.2.1 General test requirement for UTRA FDD

In the frequency range relevant for this test, the transmitter intermodulation level shall not exceed the out of band emission or the spurious emission requirements of clause 6.7.4 (OTA spectrum mask) and clause 6.7.6 (OTA spurious emission, except co-location spurious emission), in the presence of interfering signal according to table 6.8.5.2.1-1.

For *RIBs* supporting operation in *non-contiguous spectrum*, the requirement is also applicable inside a *sub-block gap* for interfering signal offsets where the interfering signal falls completely within the *sub-block gap*. The interfering signal offset is defined relative to the *sub-block* edges.

For *multi-band RIBs*, the requirement is also applicable inside an *Inter RF Bandwidth gap* for interfering signal offsets where the interfering signal falls completely within the *Base Station RF Bandwidth* gap.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause 4.1.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex C.

Table 6.8.5.2.1-1: Interfering and wanted signal frequency offset for OTA transmitter intermodulation requirement

| Parameter | Value |
| --- | --- |
| Wanted signal type | UTRA |
| Interfering signal type | UTRA |
| Interfering signal power level applied to the CLTA | min(46 dBm, Prated,t,TRP) |
| Interfering signal centre frequency offset from the lower (upper) edge of the wanted signal or edge of *sub-block* inside a gap | -2,5 MHz  -7,5 MHz  -12,5 MHz  +2,5 MHz  +7,5 MHz  +12,5 MHz |
| NOTE 1: Interference frequencies that are outside of any allocated frequency band for UTRA-FDD downlink specified in clause 4.6 are excluded from the requirement, unless the interfering signal positions fall within the frequency range of adjacent *downlink operating band*s in the same geographical area.  NOTE 2: NOTE 1 is not applied in Band I, III, VI, VIII, IX, XI, XIX, XXI, and XXXII operating within 1 475.9 MHz to 1 495.9 MHz, in certain regions.  NOTE 3: For *OTA AAS BS* with dual polarization, the interfering signal power shall be equally divided between the supported polarizations at the CLTA. | |

#### 6.8.5.3 Single RAT E-UTRA operation

##### 6.8.5.3.1 General test requirement

In the frequency range relevant for this test, the transmitter intermodulation level shall not exceed the unwanted emission limits in clauses 6.7.6 (OTA spurious emission, except co-location spurious emission), 6.7.5 (OTA OBUE) and 6.7.3 (OTA ACLR) in the presence of an E-UTRA interfering signal according to according to table 6.8.5.3.1-1.

The requirement is applicable outside the *Base Station RF Bandwidth* or *radio bandwidth*. The interfering signal offset is defined relative to the *Base Station RF Bandwidth edges* or *radio bandwidth* edges.

For *RIBs* supporting operation in *non-contiguous spectrum*, the requirement is also applicable inside a *sub-block gap* for interfering signal offsets where the interfering signal falls completely within the *sub-block gap*. The interfering signal offset is defined relative to the *sub-block* edges.

For *multi-band RIBs*, the requirement applies relative to the *Base Station RF Bandwidth edges* of each supported operating band. In case the *Inter RF Bandwidth gap* is less than 15 MHz, the requirement in the gap applies only for interfering signal offsets where the interfering signal falls completely within the inter *Base Station RF Bandwidth* gap.

Table 6.8.5.3.1-1: Interfering and wanted signals for the OTA transmitter intermodulation requirement

| Parameter | Value |
| --- | --- |
| Wanted signal | E-UTRA single carrier, or multi-carrier, or multiple intra-band contiguously or non-contiguously aggregated carriers |
| Interfering signal type | E-UTRA signal of *channel bandwidth* 5 MHz |
| Interfering signal power level applied to the CLTA | min(46 dBm, Prated,t,TRP) |
| Interfering signal centre frequency offset from the lower (upper) edge of the wanted signal or edge of *sub-block* inside a *sub-block gap* | ±2,5 MHz  ±7,5 MHz  ±12,5 MHz |
| NOTE 1: Interfering signal positions that are partially or completely outside of any *downlink operating band* of the base station are excluded from the requirement, unless the interfering signal positions fall within the frequency range of adjacent *downlink operating band*s in the same geographical area. In case that none of the interfering signal positions fall completely within the frequency range of the *downlink operating band*, TS 36.141 provides further guidance regarding appropriate test requirements.  NOTE 2: In certain regions, NOTE 1 is not applied in Band 1, 3, 8, 9, 11, 18, 19, 21, 28, 32 operating within 1 475.9 MHz to 1 495.9 MHz, 34.  NOTE 3: For *OTA AAS BS* with dual polarization, the interfering signal power shall be equally divided between the supported polarizations at the CLTA. | |

##### 6.8.5.3.2 Void

Table 6.8.5.3.2-1: Void

**<Next change>**

#### 7.7.4.2 Procedure

The following procedure for measuring TRP is based on the directional power measurements as described in Annex F. An alternative method to measure TRP is to use a characterized and calibrated reverberation chamber if so follow steps 1, 3, 4, 5, 7 and 10.

1) Place the AAS BS at the positioner.

2) Align the manufacturer declared coordinate system orientation (see table 4.10-1, D9.2) of the AAS BS with the test system.

3) Measurements shall use a measurement bandwidth in accordance to the conditions in TS 37.104 [5] clause 6.6.1.

4) The measurement device characteristics shall be:

- Detection mode: True RMS.

The emission power should be averaged over an appropriate time duration to ensure the measurement is within the measurement uncertainty in Table 4.1.2.3-1.

5) Set the TDD AAS BS to receive only

6) Orient the positioner (and BS) in order that the direction to be tested aligns with the test antenna such that measurements to determine TRP can be performed (see annex F).

7) Measure the emission at the specified frequencies with specified measurement bandwidth

8) Repeat step 6-9 for all directions in the appropriated TRP measurement grid needed for full TRP estimation (see annex F).

NOTE 1: The TRP measurement grid may not be the same for all measurement frequencies.

NOTE 2: The frequency sweep or the TRP measurement grid sweep may be done in any order.

9) Calculate TRP at each specified frequency using the directional measurements.

In addition, for *multi-band RIB(s)*, the following steps shall apply:

10) For *multi-band RIBs* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

**<Next change>**

7.9.5.1 E-UTRA test requirement

For E-UTRA, the throughput shall be ≥ 95% of the *maximum throughput* of the reference measurement channel as specified in 3GPP 36.104 [4] Annex A with parameters specified in table 10.9.4-1 for Wide Area BS, in table 10.9.4-2 for Local Area BS and in table 10.9.4-3 for Medium Range BS.

The OTA levels are applied referenced to ΔminSENS.

**Table 7.9.5.1-1 Wide Area BS in-channel selectivity for E-UTRA**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **E-UTRA**  ***channel bandwidth* [MHz]** | **Reference measurement channel** | **Wanted signal mean power [dBm]** | | **Interfering signal mean power [dBm]** | **Type of interfering signal** |
|  |  | **f ≤ 3.0 GHz** | **3.0 GHz < f ≤ 4.2 GHz** |  |  |
| 1.4 | A1-4 in 3GPP 36.104 [4] Annex A.1 | -105.2– ΔminSENS | -104.8 – ΔminSENS | -87 – ΔminSENS | 1.4 MHz E-UTRA signal, 3 RBs |
| 3 | A1-5 in 3GPP 36.104 [4] Annex A.1 | -100.4 – ΔminSENS | -100.0– ΔminSENS | -84 – ΔminSENS | 3 MHz E-UTRA signal, 6 RBs |
| 5 | A1-2 in 3GPP 36.104 [4] Annex A.1 | -98.3 – ΔminSENS | -97.9 – ΔminSENS | -81 – ΔminSENS | 5 MHz E-UTRA signal, 10 RBs |
| 10 | A1-3 in 3GPP 36.104 [4] Annex A.1 | -96.8 – ΔminSENS | -96.4 – ΔminSENS | -77 – ΔminSENS | 10 MHz E-UTRA signal, 25 RBs |
| 15 | A1-3 in 3GPP 36.104 [4] Annex A.1 (NOTE) | -96.8 – ΔminSENS | -96.4 – ΔminSENS | -77 – ΔminSENS | 15 MHz E-UTRA signal, 25 RBs (NOTE) |
| 20 | A1-3 in 3GPP 36.104 [4] Annex A.1 (NOTE) | -96.8 – ΔminSENS | -96.4 – ΔminSENS | -77 – ΔminSENS | 20 MHz E-UTRA signal, 25 RBs (NOTE) |
| NOTE: Wanted and interfering signal are placed adjacently around Fc | | | | | |

**Table 7.9.5.1-2 Local Area BS in-channel selectivity for E-UTRA**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **E-UTRA**  ***channel bandwidth* [MHz]** | **Reference measurement channel** | **Wanted signal mean power [dBm]** | | **Interfering signal mean power [dBm]** | **Type of interfering signal** |
|  |  | **f ≤ 3.0 GHz** | **3.0 GHz < f ≤ 4.2 GHz** |  |  |
| 1.4 | A1-4 in 3GPP 36.104 [4] Annex A.1 | -97.2 – ΔminSENS | -96.8 – ΔminSENS | -79 – ΔminSENS | 1.4 MHz E-UTRA signal, 3 RBs |
| 3 | A1-5 in 3GPP 36.104 [4] Annex A.1 | -92.4 – ΔminSENS | -92.0 – ΔminSENS | -76 – ΔminSENS | 3 MHz E-UTRA signal, 6 RBs |
| 5 | A1-2 in 3GPP 36.104 [4] Annex A.1 | -90.3 – ΔminSENS | -89.9 – ΔminSENS | -73 – ΔminSENS | 5 MHz E-UTRA signal, 10 RBs |
| 10 | A1-3 in 3GPP 36.104 [4] Annex A.1 (NOTE 3) | -88.8 – ΔminSENS | -88.4 – ΔminSENS | -69 – ΔminSENS | 10 MHz E-UTRA signal, 25 RBs (NOTE 3) |
| 15 | A1-3 in 3GPP 36.104 [4] Annex A.1 (NOTE 1) | -88.8 – ΔminSENS | -88.4 – ΔminSENS | -69 – ΔminSENS | 15 MHz E-UTRA signal, 25 RBs (NOTE 1) |
| 20 | A1-3 in 3GPP 36.104 [4] Annex A.1 (NOTE 1) | -88.8 – ΔminSENS | -88.4 – ΔminSENS | -69 – ΔminSENS | 20 MHz E-UTRA signal, 25 RBs (NOTE 1) |
| NOTE 1: Wanted and interfering signal are placed adjacently around Fc, this reference measurement channel and interfering signal are not applied for Band 46 nor Band 49.  NOTE 2: Void  NOTE 3: This reference measurement channel and interfering signal are not applied for Band 46 nor Band 49. | | | | | |

**Table 7.9.5.1-3 Medium Range BS in-channel selectivity for E-UTRA**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **E-UTRA**  ***channel bandwidth* [MHz]** | **Reference measurement channel** | **Wanted signal mean power [dBm]** | | **Interfering signal mean power [dBm]** | **Type of interfering signal** |
|  |  | **f ≤ 3.0 GHz** | **3.0 GHz < f ≤ 4.2 GHz** |  |  |
| 1.4 | A1-4 in 3GPP 36.104 [4] Annex A.1 | -100.2 – ΔminSENS | -99.8 – ΔminSENS | -82 – ΔminSENS | 1.4 MHz E-UTRA signal, 3 RBs |
| 3 | A1-5 in 3GPP 36.104 [4] Annex A.1 | -95.4 – ΔminSENS | -95.0 – ΔminSENS | -79 – ΔminSENS | 3 MHz E-UTRA signal, 6 RBs |
| 5 | A1-2 in 3GPP 36.104 [4] Annex A.1 | -93.3 – ΔminSENS | -92.9 – ΔminSENS | -76 – ΔminSENS | 5 MHz E-UTRA signal, 10 RBs |
| 10 | A1-3 in 3GPP 36.104 [4] Annex A.1 (NOTE 3) | -91.8 – ΔminSENS | -91.4– ΔminSENS | -72 – ΔminSENS | 10 MHz E-UTRA signal, 25 RBs (NOTE 3) |
| 15 | A1-3 in 3GPP 36.104 [4] Annex A.1 (NOTE 1) | -91.8– ΔminSENS | -91.4– ΔminSENS | -72 – ΔminSENS | 15 MHz E-UTRA signal, 25 RBs (NOTE 1) |
| 20 | A1-3 in 3GPP 36.104 [4] Annex A.1 (NOTE 1) | -91.8– ΔminSENS | -91.4– ΔminSENS | -72 – ΔminSENS | 20 MHz E-UTRA signal, 25 RBs (NOTE 1) |
| NOTE 1: Wanted and interfering signal are placed adjacently around Fc, this reference measurement channel and interfering signal are not applied for Band 46.  NOTE 2: Void  NOTE 3: This reference measurement channel and interfering signal are not applied for Band 46. | | | | | |

**<Endof change>**