**3GPP TSG-RAN4 WG4 Meeting #** **100-e *R4-2115840***

**Electronic meeting, August 16- 27, 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **37.145-1** | **CR** | xxxx | **rev** | **-** | **Current version:** | **17.2.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Big CR for TS 37.145-1 Maintenance (Rel-17, CAT A) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | MCC, Huawei | | | | | | | | | |
| ***Source to TSG*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Perf | | | | |  | ***Date:*** | | | 2021-08-29 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This big CRs merge the mutile endorsed draf CRs. The reason for change in each endorsed draft CR is copied below.  **R4-2113992 TS 37.145-1: Correction of additional spurious emission limits for bands 50, 51, 75, 76**  <Reason for change>  The emission limits contained in ECC Dec 17(06) are not incuded in the current version of the specifications.  **R4-2113998 TS 37.145-1: Clarifications and corrections on extreme test environment**  <Reason for change>  Testing under extreme conditions is not aligned with recent changes adopted for other BS specifications, especially TS 38.141-1 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The summary of change in each each endorsed draft CR is copied below.  **R4-2113992 TS 37.145-1: Correction of additional spurious emission limits for bands 50, 51, 75, 76**  <Summary of change>  Added reference to the spectrum decisions  Added a statement in the general section on spurious emissions  Implement the limits  Remove duplicate text in E-UTRA clause and refer to the MSR requirements instead.  **R4-2113998 TS 37.145-1: Clarifications and corrections on extreme test environment**  <Summary of change>  Introduce similar changes as were approved for TS 38.141-1 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The consequences if not approved for each endorsed draft CR are coppied below.  **R4-2113992 TS 37.145-1: Correction of additional spurious emission limits for bands 50, 51, 75, 76**  <Consequences if not approved>  Wrong value for unwanted emissions limit and lack of compliance with a European spectrum decision.  **R4-2113998 TS 37.145-1: Clarifications and corrections on extreme test environment**  <Consequences if not approved>  Unclear conditions for testing under extreme conditions. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | **R4-2113992 TS 37.145-1: Correction of additional spurious emission limits for bands 50, 51, 75, 76**  <Clauses affected>  2, 6.6.5.1, 6.6.5.5.4.6, 6.6.5.5.5.7, 6.6.1  **R4-2113998 TS 37.145-1: Clarifications and corrections on extreme test environment**  <Clauses affected>  6.2.2.4.1, 7.2.4.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS/TR … CR … | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR … CR … | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR … CR … | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |

|  |  |
| --- | --- |
| ***This CR’s revision history:*** |  |

***<Start of change1>***

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications"

[2] 3GPP TS 25.104: "Base Station (BS) radio transmission and reception (FDD)"

[3] 3GPP TS 25.105: "Base Station (BS) radio transmission and reception (TDD)"

[4] 3GPP TS 36.104: "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception"

[5] 3GPP TS 37.104: "NR, E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) radio transmission and reception"

[6] 3GPP TS 37.105: "Active Antenna System (AAS) Base Station (BS) transmission and reception"

[7] Recommendation ITU-R M.1545: "Measurement uncertainty as it applies to test limits for the terrestrial component of International Mobile Telecommunications-2000"

[8] 3GPP TS 37.105 (V14.1.0): "Active Antenna System (AAS) Base Station (BS) radio transmission and reception (Release 14)"

[9] 3GPP TS 25.104 (V14.2.0): "Base Station (BS) radio transmission and reception (FDD) (Release 14)"

[10] 3GPP TS 25.105 (V14.0.0): "Base Station (BS) radio transmission and reception (TDD) (Release 14)"

[11] 3GPP TS 36.104 (V14.4.0): "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception (Release 14)"

[12] 3GPP TS 37.104 (V14.4.0): "E-UTRA, UTRA and GSM/EDGE Multi-Standard Radio (MSR) Base Station (BS) radio transmission and reception (Release 14)"

[13] 3GPP TS 37.141:"NR, E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) conformance testing"

[14] 3GPP TS 36.141: "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing"

[15] 3GPP TS 25.141: "Base Station (BS) conformance testing (FDD)"

[16] 3GPP TS 37.141 (V14.4.0): "E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) conformance testing (Release 14)"

[17] 3GPP TS 36.141 (V14.4.0): "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing (Release 14)"

[18] 3GPP TS 25.141 (V14.2.0): "Base Station (BS) conformance testing (FDD) (Release 14)"

[19] 3GPP TS 25.142: "Base Station (BS) conformance testing (TDD)"

[20] 3GPP TS 25.142 (V14.0.0): "Base Station (BS) conformance testing (TDD) (Release 14)"

[21] 3GPP TR 25.942: "Radio Frequency (RF) system scenarios"

[22] 3GPP TS 45.004: "Digital cellular telecommunications system (Phase 2+); Modulation"

[23] 3GPP TS 25.214: "Physical layer procedures (FDD)"

[24] "Title 47 of the Code of Federal Regulations (CFR)", Federal Communications Commission

[25] CEPT ECC Decision (13)03: "The harmonised use of the frequency band 1452-1492 MHz for Mobile/Fixed Communications Networks Supplemental Downlink (MFCN SDL)"

[26] IEC 60721: "Classification of environmental conditions"

[27] IEC 60721-3-3: "Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weather protected locations"

[28] IEC 60721-3-4: "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 4: Stationary use at non-weather protected locations"

[29] ETSI EN 300 019-1-3: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-3: Classification of environmental conditions; Stationary use at weatherprotected locations"

[30] ETSI EN 300 019-1-4: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-4: Classification of environmental conditions; Stationary use at non-weatherprotected locations"

[31] IEC 60068-2-1 (2007): "Environmental testing - Part 2: Tests. Tests A: Cold"

[32] IEC 60068-2-2 (2007): "Environmental testing - Part 2: Tests. Tests B: Dry heat"

[33] IEC 60068-2-6 (2007): "Environmental testing - Part 2: Tests - Test Fc: Vibration (sinusoidal)"

[34] Recommendation ITU-T O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate"

[35] Recommendation ITU-R SM.329: "Unwanted emissions in the spurious domain"

[36] 3GPP TS 38.104: "NR; Base Station (BS) radio transmission and reception"

[37] 3GPP TS 38.141-1: "NR;Base Station (BS) conformance testing; Part 1: Conducted conformance testing"

[38] FCC publication number 662911: "Emissions Testing of Transmitters with Multiple Outputs in the Same Band"

[39] 3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation"

[40] 3GPP TS 37.145-2: "Active Antenna System (AAS) Base Station (BS) conformance testing; Part 2: radiated conformance testing"

[41] 3GPP TS 38.104 (V15.6.0): "NR; Base Station (BS) radio transmission and reception (Release 15)"

[42] ECC/DEC/(17)06: "The harmonised use of the frequency bands 1427-1452 MHz and 1492-1518 MHz for Mobile/Fixed Communications Networks Supplemental Downlink (MFCN SDL)"

***<End of change1>***

***<Start of change2>***

### 6.2.2 Maximum output power

#### 6.2.2.1 Definition and applicability

The rated carrier output power of the *AAS BS* shall be as specified in table 6.2.2.1-1.

Table 6.2.2.1-1: AAS Base Station rated output power limits for BS classes

|  |  |  |
| --- | --- | --- |
| AAS BS class | PRated,c,sys | PRated,c,TABC |
| Wide Area BS | (note) | (note) |
| Medium Range BS | ≤ 38 dBm +10log(NTXU,counted) | ≤ 38 dBm |
| Local Area BS | ≤ 24 dBm +10log(NTXU,counted) | ≤ 24 dBm |
| NOTE: There is no upper limit for the PRated,c,sys or PRated,c,TABC of the Wide Area Base Station. | | |

The output power limit for the respective BS classes in table 6.2.2.1-1 shall be compared to the rated output power and the declared BS class. It is not subject to testing.

The requirement in clause 6.2.2.2 applies per *TAB connector*.

#### 6.2.2.2 Minimum Requirement

The minimum requirement is in TS 37.105 [8], clause 6.2.2.2.

#### 6.2.2.3 Test Purpose

The test purpose is to verify the accuracy of the *maximum carrier output power per TAB connector* (Pmax,c,TABC) across the frequency range and under normal and extreme conditions for all *TAB connectors* in the AAS BS.

#### 6.2.2.4 Method of test

##### 6.2.2.4.1 Initial conditions

Test environment:

- normal; see clause B.2.

- extreme; see clauses B.3 and B.5

RF channels to be tested:

- B, M and T; see clause 4.12.1

*Base Station RF Bandwidth* positions to be tested:

- BRFBW, MRFBW and TRFBW for *single band TAB connector(s)* , see clause 4.12.1; BRFBW\_T'RFBW and B'RFBW\_TRFBW for *multi-band TAB connector(s)*, see clause 4.12.1.

Under extreme test environment, it is sufficient to test on one RF channel or one *Base Station RF bandwidth* position, and with one applicable test configuration defined in clauses 4.11 and 5. Testing shall be performed under extreme power supply conditions, as defined in Annex B.5.

NOTE: Tests under extreme power supply conditions also test extreme temperatures.

##### 6.2.2.4.2 Procedure

The minimum requirement is applied to all *TAB connectors*, they may be tested one at a time or multiple *TAB connectors* may be tested in parallel as shown in annex clause D.1.1. Whichever method is used the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested.

***<End of change2>***

***<Start of change3>***

### 6.6.5 Operating band unwanted emission

#### 6.6.5.1 Definition and applicability

Unless otherwise stated, for E-UTRA single band and MSR the operating band unwanted emission limits are defined from ΔfOBUE below the lowest frequency of each supported *downlink operating band* to the lower *Base Station RF Bandwidth edge* located at FBW RF,low and from the upper *Base Station RF Bandwidth edge* located at FBW RF,high up to ΔfOBUE above the highest frequency of each supported *downlink operating band*. The values of ΔfOBUE are defined in table 6.6.1-1.

For AAS BS capable of operation in multiple operating bands, using *single band TAB connector*s, the single-band requirements apply to those connectors and the cumulative evaluation of the emission limit in the *inter RF bandwidth gap* is not applicable.

The requirements shall apply whatever the type of transmitter considered and for all transmission modes foreseen by the manufacturer's specification.

For BS operating in bands n50, n51, n74, n75 and n76 additional emission limits that might be applicable outside OBUE frequency domain are specified in clause 6.6.5.5.4.6.

***<End of change3>***

***<Start of change4>***

6.6.5.5.4.6 Additional band 32, 50, 51, 74, 75 and 76 unwanted emissions

In certain regions, the following requirements may apply to a *TAB connector* operating in Band 32 within 1452-1492 MHz. The maximum level of operating band unwanted emissions, measured on centre frequencies f\_offset with filter bandwidth, according to table 6.6.5.5.4.6-1, shall be defined according to the *basic limits* PEM,B32,a , PEM,B32,b and PEM,B32,c declared by the manufacturer.

Table 6.6.5.5.4.6-1: Declared operating band 32 unwanted emission within 1452-1492 MHz

|  |  |  |
| --- | --- | --- |
| Frequency offset of measurement filter centre frequency, f\_offset | Declared emission *basic limit* (dBm) | Measurement bandwidth |
| 2.5 MHz | PEM,B32,a | 5 MHz |
| 7.5 MHz | PEM,B32,b | 5 MHz |
| 12.5 MHz ≤ f\_offset ≤ f\_offsetmax, B32 | PEM,B32,c | 5 MHz |
| NOTE: f\_offsetmax, B32  denotes the frequency difference between the lower *Base Station RF Bandwidth* edge and 1454.5 MHz, and the frequency difference between the upper  *Base Station RF Bandwidth* edge and 1489.5 MHz for the set channel position. | | |

NOTE: The regional requirement, included in [25], is defined in terms of EIRP per antenna, which is dependent on both the BS emissions at the *TAB connector* and radiated in the far field. The requirement defined above provides the characteristics of the AAS BS needed to verify compliance with the regional requirement. The assessment of the EIRP level is described in annex H of TS 36.104 [11].

In certain regions, the following requirement may apply to a *TAB connector* operating in Band 32 within 1452-1492MHz for the protection of services in spectrum adjacent to the frequency range 1452-1492 MHz. The maximum level of emissions, measured on centre frequencies Ffilter with filter bandwidth according to table 6.6.5.5.4.6-2, shall be defined according to the *basic limits* PEM,B32,d and PEM,B32,e declared by the manufacturer. This requirement applies in the frequency range 1429-1518MHz even though part of the range falls in the spurious domain.

Table 6.6.5.5.4.6-2: Operating band 32 declared emission outside 1452-1492 MHz

|  |  |  |
| --- | --- | --- |
| Filter centre frequency, Ffilter | Declared emission *basic limit* (dBm) | Measurement bandwidth |
| 1429.5 MHz ≤ Ffilter ≤ 1448.5 MHz | PEM,B32,d | 1 MHz |
| Ffilter = 1450.5 MHz | PEM,B32,e | 3 MHz |
| Ffilter = 1493.5 MHz | PEM,B32,e | 3 MHz |
| 1495.5 MHz ≤ Ffilter ≤ 1517.5 MHz | PEM,B32,d | 1 MHz |

NOTE: The regional requirement, included in [23], is defined in terms of EIRP, which is dependent on both the BS emissions at the antenna connector and radiated in the far field. The requirement defined above provides the characteristics of the AAS BS needed to verify compliance with the regional requirement. The assessment of the EIRP level is described in annex H of TS 36.104 [11].

In certain regions, the following requirement may apply to NR BS operating in Band 50 and 75 within the 1432 – 1452 MHz, and in Band 51 and Band 76. The *basic limit is* specified in Table 6.6.5.5.4.6-3.

Table 6.6.5.5.4.6-3: Additional emission *basic limit* for BS operating in Band 50 and 75 within 1432 – 1452 MHz, and in Band 51 and 76

|  |  |  |
| --- | --- | --- |
| Filter centre frequency, Ffilter | *Basic limit* | *Measurement Bandwidth* |
| Ffilter = 1413.5 MHz | -42 dBm | 27 MHz |

In certain regions, the following requirement may apply to BS operating in Band 50 and 75 within 1492-1517 MHz and in Band 74 within 1492-1518 MHz. The maximum level of emissions, measured on centre frequencies Ffilter with filter bandwidth according to Table 6.6.5.5.4.6-4, shall be defined according to the *basic limits* PEM,n50/n75,a nor PEM,n50/n75,b declared by the manufacturer.

Table 6.6.5.5.4.6-4: *Operating band* 50, 74 and 75 declared emission above 1518 MHz

|  |  |  |
| --- | --- | --- |
| Filter centre frequency, Ffilter | Declared *basic limits* (dBm) | *Measurement bandwidth* |
| 1518.5 MHz ≤ Ffilter ≤ 1519.5 MHz | PEM, n50/n75,a | 1 MHz |
| 1520.5 MHz ≤ Ffilter ≤ 1558.5 MHz | PEM,n50/n75,b | 1 MHz |

NOTE: The regional requirement, included in ECC/DEC/(17)06 [42], is defined in terms of EIRP, which is dependent on both the BS emissions at the antenna connector and the deployment (including antenna gain and feeder loss). The requirement defined above provides the characteristics of the base station needed to verify compliance with the regional requirement. The assessment of the EIRP level is described in TS 37.105 [6], Annex B.1.

6.6.5.5.4.7 Additional requirements for Band 48

The following requirement may apply to AAS BS operating in Band 48 in certain regions. Emissions shall not exceed the maximum levels specified in Table 6.6.2.5.4.7-1.

***<End of change4>***

***<Start of change5>***

In regions where FCC regulation applies, requirements for protection of GPS according to FCC Order DA 20-48applies for operation in Band 24. The following normative requirement covers the base station, to be used together with other information about the site installation to verify compliance with the requirement in FCC Order DA 20-48. The requirement applies to a *TAB connector* operating in Band 24 to ensure that appropriate interference protection is provided to the GPS. This requirement applies to the frequency range 1541-1650 MHz, even though part of this range falls within the spurious domain.

The maximum level of emissions in the 1541 - 1650 MHz band, measured in measurement bandwidth according to table 6.6.5.5.5.7-6 shall be based upon declared *basic limits* PEM\_B24,a, PEM\_B24,b, PEM\_B24,c, PEM\_B24d, PEM\_B24,e and PEM\_B24,f declared by the manufacturer.

Table 6.6.5.5.5.7-6: Declared emissions *basic limits* for protection of the 1541-1650 MHz band

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operating Band | Frequency range (MHz) | Declared emission level (dBW)  (Measurement bandwidth = 1 MHz) | Declared emission *basic limit* (dBW) of discrete emissions of less than 700 Hz bandwidth  (Measurement bandwidth = 1 kHz) | Declared emission *basic limit* (dBW) of discrete emissions of less than 2 kHz bandwidth  (Measurement bandwidth = 1 kHz) |
| 24 | 1541 - 1559 | PEM\_B24,a |  | PEM\_B24,f |
| 1559 - 1610 | PEM\_B24,b | PEM\_B24,d |  |
| 1610 - 1650 | PEM\_B24,c | PEM\_B24,e |  |

NOTE 2: The regional requirements in FCC Order DA 20-48 are defined in terms of EIRP, which is dependent on both the BS emissions at the *TAB connector* and the RND and antenna array. The EIRP level is calculated using: PEIRP = PE + Gant where PE denotes the *TAB connector* unwanted emission level at the *TAB connector*, Gant equals the RDN and antenna array gain. The requirement defined above provides the characteristics of the base station needed to verify compliance with the regional requirement. Compliance with the regional requirement can be determined using the method outlined in annex G of TS 36.104 [11].

Table 6.6.5.5.5.7-7: Void

Table 6.6.5.5.5.7-8: void



Table 6.6.5.5.5.7-9: void



For BS operating in bands 32, 50, 51, 74,75 and 76 additional emission limits that might be applicable in the OBUE frequency domain are specified in clause 6.6.5.5.4.6.

In certain regions the following requirement may apply to an E-UTRA *TAB connector* operating in Band 45. *Basic limits* are specified in table 6.6.5.5.5.7-10.

Table 6.6.5.5.5.7-10: Emissions *basic limits* for protection of adjacent band services

|  |  |  |  |
| --- | --- | --- | --- |
| **Operating Band** | **Filter centre frequency, Ffilter** | ***Basic limit* (dBm)** | **Measurement Bandwidth** |
|  | Ffilter = 1467.5 | -20 | 1 MHz |
|  | Ffilter = 1468.5 | -23 | 1 MHz |
| 45 | Ffilter = 1469.5 | -26 | 1 MHz |
|  | Ffilter = 1470.5 | -33 | 1 MHz |
|  | Ffilter = 1471.5 | -40 | 1 MHz |
|  | 1472.5 MHz ≤ Ffilter ≤ 1491.5 MHz | -47 | 1 MHz |

The following requirement may apply to E-UTRA BS operating in Band 48 in certain regions. Emissions shall not exceed the maximum levels specified in Table 6.6.5.5.5.7-11.

Table 6.6.5.5.5.7-11: Additional operating band unwanted emission limits for Band 48

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Channel bandwidth | Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement | Measurement bandwidth (Note 3) |
| All | 0 MHz ≤ Δf < 10 MHz | 0.5 MHz ≤ f\_offset < 9.5 MHz | -13 dBm | 1 MHz |

### 6.6.6 Spurious emission

#### 6.6.6.1 Definition and applicability

The conducted transmitter spurious emission limits apply from 9 kHz to 12.75 GHz, excluding the following RAT-specific frequency ranges:

- UTRA TDD BS, 1.28 Mcps option as specified in TS 25.105 [3]: from 4 MHz below the lowest frequency of each operating band to 4 MHz above the highest frequency of each operating band.

- UTRA FDD BS as specified in TS 25.104 [2]: from 12.5MHz below the lowest carrier frequency used up to 12.5MHz above the highest carrier frequency used.

- E-UTRA BS as specified in TS 36.104 [4]: from ΔfOBUE below the lowest frequency of the *downlink operating band* up to ΔfOBUE above the highest frequency of the *downlink operating band*, where ΔfOBUE is defined clause 6.6.1.

- MSR BS as specified in TS 37.104 [5]: from ΔfOBUE below the lowest frequency of the *downlink operating band* up to ΔfOBUE above the highest frequency of the *downlink operating band*, where ΔfOBUE is defined clause 6.6.1.

For some operating bands the upper frequency limit is higher than 12.75 GHz in order to comply with the 5th harmonic limit of the *downlink operating band*, as specified in ITU-R recommendation SM.329 [14]. In some exceptional cases, requirements apply also closer than ΔfOBUE MHz from the *downlink operating band*; these cases are highlighted in the requirement tables in respective referenced UTRA, E-UTRA or MSR specifications. For operating bands supported by *multi-band TAB connectors* exclusion bands apply to each supported band.

The requirements applies for both single band and multiband *TAB connectors* (except for frequencies at which exclusion bands or other multi-band provisions apply) and for all transmission modes foreseen by the manufacturer's specification. Unless otherwise stated, all requirements are measured as mean power.

For operation in region 2, where the FCC guidance for MIMO systems in [38] is applicable, NTXU,countedpercell shall be equal to 1 for the purposes of calculating the spurious emissions limits in clauses 6.6.6. For all other unwanted emissions requirements, NTXU,countedpercell shall be the value calculated according to clause 6.1, unless stated differently in regional regulation.

The AAS BS test requirements for co-location spurious emissions limits which are specified for Band 46 in TS 37.104 [5], are applicable for AAS BS.

For BS operating in bands n50, n51, n74, n75 and n76 additional emission limits that might be applicable in the spurious emissions frequency domain are specified in clause 6.6.5.5.4.6.

#### 6.6.6.2 Minimum requirement

The minimum requirement for MSR operation are defined in TS 37.105 [8], clause 6.6.6.2.

***<End of change5>***

***<Start of change6>***

## 7.2 Reference sensitivity level

### 7.2.1 Definition and applicability

The reference sensitivity power level PREFSENS is the minimum mean power received at the *TAB connector* at which a reference performance requirement shall be met for a specified reference measurement channel.

### 7.2.2 Minimum Requirement

The single RAT UTRA FDD AAS BS of Wide Area BS class shall fulfil minimum requirements for reference sensitivity specified in TS 25.104 [9], clause 7.2.1.

The single RAT UTRA FDD AAS BS of Medium Range BS class shall fulfil minimum requirements for reference sensitivity specified in TS 25.104 [9], clause 7.2.1.

The single RAT UTRA FDD AAS BS of Local Area BS class shall fulfil minimum requirements for reference sensitivity specified in TS 25.104 [9], clause 7.2.1.

The single RAT UTRA TDD AAS BS of Wide Area BS class shall fulfil minimum requirements for reference sensitivity specified in TS 25.105 [10], clause 7.2.1.1.

The single RAT UTRA TDD AAS BS of Local Area BS class shall fulfil minimum requirements for reference sensitivity specified in TS 25.105 [10], clause 7.2.1.1.

The single RAT E-UTRA AAS BS of Wide Area BS class shall fulfil minimum requirements for reference sensitivity specified in TS 36.104 [11], clause 7.2.1.

The single RAT E-UTRA AAS BS of Medium Range BS class shall fulfil minimum requirements for reference sensitivity specified in TS 36.104 [11], clause 7.2.1.

The single RAT E-UTRA AAS BS of Local Area BS class shall fulfil minimum requirements for reference sensitivity specified in TS 36.104 [11], clause 7.2.1.

The MSR NR AAS BS of Wide Area BS class shall fulfil minimum requirements for reference sensitivity specified in TS 38.104 [36], clause 7.2.1.

The MSR NR AAS BS of Medium Range BS class shall fulfil minimum requirements for reference sensitivity specified in TS 38.104 [36], clause 7.2.1.

The MSR NR AAS BS of Local Area BS class shall fulfil minimum requirements for reference sensitivity specified in TS 38.104 [36], clause 7.2.1.

### 7.2.3 Test Purpose

To verify that at each *TAB connector* the reference sensitivity level the performance requirements shall be met for a specified reference measurement channel.

### 7.2.4 Method of test

#### 7.2.4.1 Initial conditions

Test environment:

- normal; see clause B.2.

- extreme; see clauses B.3 and B.5

RF channels to be tested for single carrier:

- B, M and T; see clause 4.12.1.

Under extreme test environment, the test shall be performed on each of B, M and T under extreme power supply as defined in annex B.5.

NOTE: Tests under extreme power supply conditions also test extreme temperatures.

#### 7.2.4.2 Procedure

The minimum requirement is applied to all *TAB connectors,* the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested; see clause 7.1.

***<End of change6>***