**3GPP TSG-RAN4 Meeting #96-e**

**E-Meeting, 17 - 28 August 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.141-2** | **CR** | **0213** | **rev** | **1** | **Current version:** | **15.6.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | CR to TS 38.141-2: Additional requirements for EESS protection (rel-15) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | NEC | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Perf | | | | |  | ***Date:*** | | | 2020-08-7 |
|  |  | | | |  | |  | | |  |
| ***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 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:*** | | In the current specification, it looks protection of EESS for OTA receiver spurious requirements for BS type 2-O are mandatory. Protection of EESS shall not be mandated.  TT values for OTA OBUE and OTA TX spurious requirements for EESS protection are specifited in the tables for FR1. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | It is made clear that EESS protection may be applied.  Deleted the TT values for OTA OBUE and OTA TX spurious for EESS protection in the table for FR1, and added them in the table for FR2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Applicability of EESS protection for BS type 2-O is not correct. TT value tables are not correct. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.7.5.2, C.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS 38.104 | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Proposed text in 7.7.5.2 was modified based on the comments in the email discussion. “reason for change”, “summary of change”, “consequences if not approved” were also modified. | | | | | | | | |

**--------------Start of change-------------**

#### 7.7.5.2 Test requirement for *BS type 2-O*

The power of any receiver spurious emission shall not exceed the limits in table 7.7.5.2-1.

Table 7.7.5.2-1: Radiated Rx spurious emission limits for *BS type 2-O*

|  |  |  |  |
| --- | --- | --- | --- |
| Spurious  frequency range  (Note 4) | Limit (Note 5) | Measurement Bandwidth | Note |
| 30 MHz ↔ 1 GHz | -36 dBm | 100 kHz | Note 1 |
| 1 GHz ↔ 18 GHz | -30 dBm | 1 MHz | Note 1 |
| 18 GHz ↔ Fstep,1 | -20 dBm | 10 MHz | Note 2 |
| Fstep,1  ↔ Fstep,2 | -15 dBm | 10 MHz | Note 2 |
| Fstep,2 ↔ Fstep,3 | -10 dBm | 10 MHz | Note 2 |
| Fstep,4  ↔ Fstep,5 | -10 dBm | 10 MHz | Note 2 |
| Fstep,5  ↔ Fstep,6 | -15 dBm | 10 MHz | Note 2 |
| Fstep,6 ↔ min(2nd harmonic of the upper frequency edge of the UL operating band in GHz; 60 GHz) | -20 dBm | 10 MHz | Note 2, Note 3 |
| NOTE 1: Bandwidth as in ITU-R SM.329 [2], s4.1  NOTE 2: Limit and bandwidth as in ERC Recommendation 74-01 [19], Annex 2.  NOTE 3: Upper frequency as in ITU-R SM.329 [2], s2.5 table 1.  NOTE 4: The step frequencies Fstep,X are defined in Table 7.7.5.2-2.  NOTE 5: Additional limits may apply regionally. | | | |

Table 7.7.5.2-2: Step frequencies for defining the the radiated Rx spurious emission limits   
for *BS type 2-O*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operating band | Fstep,1 (GHz) | Fstep,2 (GHz) | Fstep,3 (GHz) | Fstep,4 (GHz) | Fstep,5 (GHz) | Fstep,6 (GHz) |
| n257 | 18 | 23.5 | 25 | 31 | 32.5 | 41.5 |
| n258 | 18 | 21 | 22.75 | 29 | 30.75 | 40.5 |
| n260 | 25 | 34 | 35.5 | 41.5 | 43 | 52 |
| n261 | 18 | 25.5 | 26.0 | 29.85 | 30.35 | 38.35 |

In addition, the following requirement may be applied for protection of EESS for BS operating in frequency range 24.25 – 27.5 GHz:

The power of any receiver spurious emission shall not exceed the limits in Table 7.7.5.2-3.

Table 7.7.5.2-3: Limits for protection of Earth Exploration Satellite Service

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Limit | *Measurement Bandwidth* | Note |
| 23.6 – 24 GHz | -3 dBm | 200 MHz | Note 1 |
| 23.6 – 24 GHz | -9 dBm | 200 MHz | Note 2 |
| NOTE 1: This limit applies to BS brought into use on or before 1 September 2027 and enters into force from January 1, 2021.  NOTE 2: This limit applies to BS brought into use after 1 September 2027. | | | |

**--------------Next change-------------**

# C.1 Measurement of transmitter

Table C.1-1: Derivation of test requirements (FR1 OTA transmitter tests)

|  |  |  |  |
| --- | --- | --- | --- |
| Test | Minimum requirement in TS 38.104 [2] | Test Tolerance (TTOTA) | Test requirement in the present document |
| 6.2 Radiated transmit power | See TS 38.104 [2], clause 9.2 | Normal conditions:  1.1 dB, f ≤ 3.0 GHz  1.3 dB, 3.0 GHz < f ≤ 4.2 GHz  1.3 dB, 4.2 GHz < f ≤ 6.0 GHz  Extreme conditions:  2.5 dB, f ≤ 3.0 GHz  2.6 dB, 3.0 GHz < f ≤ 4.2 GHz  2.6 dB, 4.2 GHz < f ≤ 6.0 GHz | Formula:  Upper limit + TT, Lower limit – TT |
| 6.3 OTA base station output power | See TS 38.104 [2], clause 9.3 | 1.4 dB, f ≤ 3.0 GHz  1.5 dB, 3.0 GHz < f ≤ 4.2 GHz  1.5 dB, 4.2 GHz < f ≤ 6.0 GHz | Formula:  Upper limit + TT, Lower limit – TT |
| 6.4 OTA output power dynamics | See TS 38.104 [2], clause 9.4 | 0.4 dB | Formula:  Total power dynamic range – TT |
| 6.5.1 OTA transmitter OFF power | See TS 38.104 [2], clause 9.5.2 | 3.4 dB , f ≤ 3.0GHz  3.6 dB, 3.0GHz < f ≤ 4.2GHz  3.6 dB, 4.2GHz < f ≤ 6.0GHz | Formula:  Minimum Requirement + TT |
| 6.6.2 OTA frequency Error | See TS 38.104 [2], clause 9.6.1 | 12 Hz | Formula:  Frequency Error limit + TT |
| 6.6.3 OTA Modulation quality (EVM) | See TS 38.104 [2], clause 9.6.2 | 1% | Formula:  EVM limit + TT |
| 6.6.4 OTA time alignment error | See TS 38.104 [2], clause 9.6.3 | 25 ns |  |
| 6.7.2 OTA occupied bandwidth | See TS 38.104 [2], clause 9.7.2 | 0 Hz | Formula:  Minimum Requirement + TT |
| 6.7.3 OTA Adjacent Channel Leakage Power Ratio (ACLR) | See TS 38.104 [2], clause 9.7.3 | Relative:  1.0 dB, f ≤ 3.0GHz  1.2 dB, 3.0GHz < f ≤ 4.2GHz  1.2 dB, 4.2GHz < f ≤ 6.0GHz  Absolute:  0 dB | Formula:  Relative limit - TT  Absolute limit +TT |
| 6.7.4 OTA operating band unwanted emissions | See TS 38.104 [2], clause 9.7.4 | Offsets < 10MHz  1.8 dB, f ≤ 3.0GHz  2 dB, 3.0GHz < f ≤ 4.2GHz  2 dB, 4.2GHz < f ≤ 6.0GHz  Offsets ≥ 10MHz  0 dB | Formula:  Minimum Requirement + TT |
| 6.7.5.2 General transmitter spurious emissions requirements  Category A | See TS 38.104 [2], clause 9.7.5.2.2 | 0 dB | Formula:  Minimum Requirement + TT |
| 6.7.5.2 General transmitter spurious emissions requirements  Category B | See TS 38.104 [2], clause 9.7.5.2.2 | 0 dB | Formula:  Minimum Requirement + TT |
| 6.7.5.3 Protection of the BS receiver of own or different BS | See TS 38.104 [2], clause 9.7.5.2.3 | 3.1 dB, f ≤ 3.0GHz  3.3 dB, 3.0GHz < f ≤ 4.2GHz  3.4 dB, 4.2GHz < f ≤ 6.0GHz | Formula:  Minimum Requirement + TT |
| 6.7.5.4 Additional spurious emissions requirements | See TS 38.104 [2], clause 9.7.5.2.4 | 2.6 dB, f ≤ 3 GHz  3.0 dB, 3 GHz < f ≤ 4.2 GHz  3.5 dB, 4.2 GHz < f ≤ 6 GHz  For co-existence with PHS  0 dB | Formula:  Minimum Requirement + TT |
| 6.7.5.5 Co-location with other base stations | See TS 38.104 [2], clause 9.7.5.2.5 | 3.1 dB, f ≤ 3.0GHz  3.3 dB, 3.0GHz < f ≤ 4.2GHz  3.4 dB, 4.2GHz < f ≤ 6.0GHz | Formula:  Minimum Requirement + TT |
| 6.8 OTA transmitter intermodulation | See TS 38.104 [2], clause 9.8 | 0 dB |  |
| NOTE: TT values are applicable for normal condition unless otherwise stated. | | | |

Table C.1-2: Derivation of test requirements (FR2 OTA transmitter tests)

|  |  |  |  |
| --- | --- | --- | --- |
| Test | Minimum requirement in TS 38.104 [2] | Test Tolerance (TTOTA) | Test requirement in the present document |
| 6.2 Radiated transmit power | See TS 38.104 [2], clause 9.2 | Normal conditions:  1.7 dB, 24.25GHz < f ≦ 29.5GHz  2.0 dB, 37GHz < f ≦ 40GHz  Extreme conditions:  3.1 dB, 24.25GHz < f ≦ 29.5GHz  3.3 dB, 37GHz < f ≦ 40GHz | Formula:  Upper limit + TT, Lower limit – TT |
| 6.3 OTA base station output power | See TS 38.104 [2], clause 9.3 | 2.1 dB, 24.25GHz < f ≦ 29.5GHz  2.4 dB, 37GHz < f ≦ 40GHz | Formula:  Upper limit + TT, Lower limit – TT |
| 6.4 OTA output power dynamics | See TS 38.104 [2], clause 9.4 | 0.4 dB | Formula:  Total power dynamic range – TT |
| 6.5.1 OTA transmitter OFF power | See TS 38.104 [2], clause 9.5.2 | 2.9 dB, 24.25GHz < f ≦ 29.5GHz  3.3 dB, 37GHz < f ≦ 40GHz | Formula:  Minimum Requirement + TT |
| 6.6.2 OTA frequency Error | See TS 38.104 [2], clause 9.6.1 | 12 Hz | Formula:  Frequency Error limit + TT |
| 6.6.3 OTA Modulation quality (EVM) | See TS 38.104 [2], clause 9.6.2 | 1 % | Formula:  EVM limit + TT |
| 6.6.4 OTA time alignment error | See TS 38.104 [2], clause 9.6.3 | 25 ns |  |
| 6.7.2 OTA occupied bandwidth | See TS 38.104 [2], clause 9.7.2 | 0 Hz | Formula:  Minimum Requirement + TT |
| 6.7.3 OTA Adjacent Channel Leakage Power Ratio (ACLR) | See TS 38.104 [2], clause 9.7.3 | Relative:  2.3 dB, 24.25GHz < f ≦ 29.5GHz  2.6 dB, 37GHz < f ≦ 40GHz  Absolute:  2.7 dB, 24.25GHz < f ≦ 29.5GHz  2.7 dB, 37GHz < f ≦ 40GHz | Formula:  Relative limit - TT  Absolute limit +TT |
| 6.7.4 OTA operating band unwanted emissions | See TS 38.104 [2], clause 9.7.4 | 0 MHz ≤ Δf < 0.1\*BWcontiguous  2.7 dB, 24.25GHz < f ≦ 29.5GHz  2.7 dB, 37GHz < f ≦ 40GHz  0.1\*BWcontiguous ≤ Δf < Δfmax  0 dB  For co-existence with Earth Exploration Satellite Service 0 dB | Formula:  Minimum Requirement + TT |
| 6.7.5.2 General transmitter spurious emissions requirements  Category A | See TS 38.104 [2], clause 9.7.5.3.2 | 0 dB | Formula:  Minimum Requirement + TT |
| 6.7.5.2 General transmitter spurious emissions requirements  Category B | See TS 38.104 [2], clause 9.7.5.3.2 | 0 dB | Formula:  Minimum Requirement + TT |
| 6.7.5.4 OTA transmitter spurious emissions, additional requirements | See TS 38.104 [2], subclause 9.7.5.3.3 | For co-existence with Earth Exploration Satellite Service 0 dB | Formula:  Minimum Requirement + TT |
| NOTE: TT values are applicable for normal condition unless otherwise stated. | | | |

**--------------End of change-------------**