**3GPP TSG- Meeting # *rev-***

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | **0024** | **rev** | **1** | **Current version:** |  |  |
|  |
| *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:***  |  |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | LTE\_NBIoT\_eMTC\_NTN\_req-Core |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** |  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | In the current specifications for SAN RF requirements, munimum requirements for unwanted emissions are missing.  |
|  |  |
| ***Summary of change:*** | For SAN type 1-H, rename the subclause titles for basic limits and add new subclauses for minimum requirements.For SAN type 1-O, add text to specify the minimum requirements. |
|  |  |
| ***Consequences if not approved:*** | Minimum requirements are not specified. |
|  |  |
| ***Clauses affected:*** | 6.6.4.2, 6.6.4.3, 6.6.5.3, 9.7.5.2.2 |
|  |  |
|  | **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:*** | Scaling is removed. |

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

### 6.6.4 Out-of-band emissions

#### 6.6.4.1 General

Unless otherwise stated, the out-of-band emissions (OOBE) limits for SAN are defined from BWSAN channel edge up to frequencies separated from the BWSAN channel edge by 200% of the *necessary bandwidth*, where the *necessary bandwidth* is BWSAN.

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

*Basic limits* are specified in the tables below, where:

- Δf is the separation between the BWSAN *channel edge* frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency.

- f\_offset is the separation between the *channel edge* frequency and the centre of the measuring filter.

- $Δ\_{Sat\\_Class}\left[dB\right]$ is the *SAN class parameter* in dB identified to characterize different SAN classes.

#### 6.6.4.2 *Basic limits*

For SAN operating in Bands 256, 255, 254, 253,the requirements are specified in table 6.6.4.2-1 for GEO and LEO class respectively, in line with Annex 5 of ITU recommendation SM.1541-6 [6].

The SAN out-of-band emissions (OOBE) requirements for GEO and LEO classes are therefore defined as described in Table 6.6.4.2‑1 below.

Table 6.6.4.2-1: SAN LEO and GEO Classes OBUE basic limits

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Basic limits(dBm) | Measurement bandwidth |
| 0 MHz ≤ Δf < 2×BWSAN | 0.002 MHz ≤ f\_offset < 2×BWSAN + 0.002 MHz | $$max\left(SE limit, P\_{rated,t,sys} – 10log10(BW\_{SAN}) – 24 – Δ\_{Sat\\_Class}\left[dB\right]-40×log10\left(\frac{ f\_{\\_offset}-0.002}{BW\_{SAN}}×2+1\right)\right)dBm$$ | 4 kHz |
| NOTE 1: BWSAN is in the unit of MHz.NOTE 2: SE limit is spurious emission limit specified in spurious emission clause 6.6.5.NOTE 3: PSD attenuation as in ITU-R SM.1541-6 [6], Annex 5 OoB domain emission limits for space services.NOTE 4: $Δ\_{Sat\\_Class}\left[dB\right]$=0 dB for GEO class and $Δ\_{Sat\\_Class}\left[dB\right]$=3 dB for LEO class. |

#### 6.6.4.3 Minimum requirements for *SAN type 1-H*

The out-of-band emissions minimum requirements for *SAN type 1-H* are that for each *TAB connector TX min cell group* and each applicable *basic limit* in clause 6.6.4.2, the power summation emissions at the *TAB connectors* of the *TAB connector TX min cell group* shall not exceed a SAN limit specified as the *basic limit*.

### 6.6.5 Transmitter spurious emissions

#### 6.6.5.1 General

The transmitter spurious emission limits shall apply from 30 MHz to the fifth harmonic of the upper frequency edge of the DL operating band, excluding the *SAN transponder bandwidth* BWSAN and the frequency range where the out-of-band emissions apply. For some *operating bands*, the upper 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 [2].

The requirements shall apply to SAN that supports E-UTRA or NB-IoT standalone operation.

The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

Unless otherwise stated, all requirements are measured as mean power (RMS).

#### 6.6.5.2 Basic Limits

##### 6.6.5.2.1 General transmitter spurious emissions requirements

The *basic limits* of table 6.6.5.2.1-1 shall apply. The application of those limits shall be the same as for operating band unwanted emissions in clause 6.6.4.

Table 6.6.5.2.1-1: General SAN transmitter spurious emission limits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Spurious frequency range | Prated,c,sys(dBm) | Basic limit(dBm) | Measurement bandwidth(kHz) | Notes |
| 30 MHz – 5th harmonic of the upper frequency edge of the DL operating band | ≤ 47 | -13 | 4 | NOTE 1, NOTE 2, NOTE 3 |
|  | > 47 | Prated,c,sys – 60 |  |  |
| NOTE 1: *Measurement bandwidth*s as in ITU-R SM.329 [2], s4.1.NOTE 2: Upper frequency as in ITU-R SM.329 [2], s2.5 table 1.NOTE 3: The lower frequency limit is replaced by 0.7 times the waveguide cut-off frequency, according to ITU-R SM.329 [2], for systems having an integral antenna incorporating a waveguide section, or with an antenna connection in such form, and of unperturbed length equal to at least twice the cut-off. |

##### 6.6.5.2.2 Protection of the own Satellite Access Node receiver

This requirement shall be applied for E-UTRA FDD operation in order to prevent the receivers of the SAN being de-sensitized by emissions from its own SAN transmitter. It is measured at the *TAB connector* for *SAN type 1-H* for any type of SAN which has common or separate Tx/Rx *TAB connectors*.

The spurious emission *basic limits* are provided in table 6.6.5.2.2-1.

Table 6.6.5.2.2-1: SAN spurious emissions *basic limits* for protection of the SAN receiver

|  |  |  |
| --- | --- | --- |
| Frequency range | *Basic limits* | *Measurement bandwidth* |
| FUL,low – FUL,high | -96 dBm | 100 kHz |

##### 6.6.5.2.3 Additional spurious emissions requirements

The additional spurious emissions requirement is not applicable for SAN.

#### 6.6.5.3 Minimum requirements for *SAN type 1-H*

The transmitter spurious emissions requirements for *SAN type 1-H* are that for each *TAB connector TX min cell group* and each applicable *basic limit* in clause 6.6.5.2, the power summation emissions at the *TAB connectors* of the *TAB connectors* of the *TAB connector TX min cell group* shall not exceed a limit specified as the *basic limit*.

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

#### 9.7.5.2 Minimum requirement for *SAN type 1-O*

##### 9.7.5.2.1 General

The OTA transmitter spurious emission limits shall apply from 30 MHz to the 5th harmonic of the upper frequency edge of the DL operating band, excluding the *SAN transponder bandwidth* BWSAN and the frequency range where the out-of-band emissions apply.

The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

##### 9.7.5.2.2 General OTA transmitter spurious emissions requirements

The *basic limits* of table 9.7.5.2.2-1 shall apply. The application of those limits shall be the same as for out-of-band emissionsin clause 6.6.4.

Table 9.7.5.2.2-1: General SAN transmitter spurious emission limits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Spurious frequency range** | **Prated,c,TRP****(dBm)** | **Basic limit****(dBm)** | **Measurement bandwidth****(kHz)** | **Notes** |
| 30 MHz – 5th harmonic of the upper frequency edge of the DL operating band | ≤ 47 | -13 | 4 | NOTE 1, NOTE 2, NOTE 3 |
|  | > 47 | Prated,c,TRP – 60 dB |  |  |
| NOTE 1: *Measurement bandwidth*s as in ITU-R SM.329 [2], s4.1.NOTE 2: Upper frequency as in ITU-R SM.329 [2], s2.5 table 1.NOTE 3: The lower frequency limit is replaced by 0.7 times the waveguide cut-off frequency, according to ITU-R SM.329 [2], for systems having an integral antenna incorporating a waveguide section, or with an antenna connection in such form, and of unperturbed length equal to at least twice the cut-off. |

The transmitter spurious emissions minimum requirements for *SAN type 1-O* are that for each applicable *basic limit* above 30 MHz in table 9.7.5.2.2-1, the TRP of any spurious emission shall not exceed an OTA limit specified as the *basic limit*.

##### 9.7.5.2.3 Protection of the SAN receiver

The co-location requirement is not applicable for SAN in this version of the specification.

##### 9.7.5.2.4 Additional spurious emissions requirements

The additional spurious emissions requirement is not applicable for SAN.

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