**3GPP TSG-RAN WG4 Meeting # 102-e R4-2203954**

**Electronic Meeting, February 21 – March 3, 2022**

Title: TP for 38.108: clause 6.6.1&6.6.2&6.6.3 unwanted emissions

Source: CATT

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# Introduction

This contribution provides a text proposal for 38.108: clause 6.6.1&6.6.2&6.6.3 unwanted emissions [1].

# Reference

[1] TR 38.108, 0.0.1

# Text proposal

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## 6.6 Unwanted emissions

### 6.6.1 General

Unwanted emissions consist of out-of-band emissions and spurious emissions according to ITU definitions [2]. In ITU terminology, out of band emissions are unwanted emissions immediately outside the *SAN channel bandwidth* resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The out-of-band emissions requirement for the SAN transmitter is specified both in terms of Adjacent Channel Leakage power Ratio (ACLR) and *operating band* unwanted emissions (OBUE).

The maximum offset of the *operating band* unwanted emissions mask from the *operating band* edge is ΔfOBUE. The Operating band unwanted emissions define all unwanted emissions in each supported downlink *operating band* plus the frequency ranges ΔfOBUE above and ΔfOBUE below each band. Unwanted emissions outside of this frequency range are limited by a spurious emissions requirement.

The values of ΔfOBUE are defined in table 6.6.1-1 for the SAN *operating bands*.

Table 6.6.1-1: Maximum offset of OBUE outside the downlink *operating band*

|  |  |  |
| --- | --- | --- |
| SAN type | *Operating band* characteristics | ΔfOBUE (MHz) |
| *SAN type 1-H* | FDL,high – FDL,low < 100 MHz | 10 |

For *SAN type 1-H* the unwanted emission requirements are applied per the *TAB connector TX min cell groups* for all the configurations supported by the SAN.

There is in addition a requirement for occupied bandwidth.

### 6.6.2 Occupied bandwidth

#### 6.6.2.1 General

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The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage /2 of the total mean transmitted power. See also Recommendation ITU-R SM.328 [3].

The value of /2 shall be taken as 0.5%.

The minimum requirement below may be applied regionally. There may also be regional requirements to declare the occupied bandwidth according to the definition in the present clause.

For SAN *type 1-H* this requirement shall be applied at each *TAB connector* supporting transmission in the *operating band.*

#### 6.6.2.2 Minimum requirement

The occupied bandwidth for each carrier shall be less than the *SAN channel bandwidth*.

### 6.6.3 Adjacent Channel Leakage Power Ratio

#### 6.6.3.1 General

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the filtered mean power centred on the assigned channel frequency to the filtered mean power centred on an adjacent channel frequency.

The requirements shall apply outside the *SAN RF Bandwidth* or *Radio Bandwidth* whatever the type of transmitter considered (single carrier or multi-carrier) and for all transmission modes foreseen by the manufacturer’s specification.

#### 6.6.3.2 Minimum requirement

The ACLR is defined with a square filter of bandwidth equal to the transmission bandwidth configuration of the transmitted signal (BWConfig) centred on the assigned channel frequency and a filter centred on the adjacent channel frequency according to the tables below.

The ACLR limits in table 6.6.3.2-1 or the ACLR absolute limits in table 6.6.3.2-2 or, whichever is less stringent, shall apply at the TAB antenna connector.

Table 6.6.3.2-1: SAN ACLR limit

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *SAN channel bandwidth* of *lowest/highest carrier* transmitted BWChannel (MHz) | SAN adjacent channel centre frequency offset below the lowest or above the highest carrier centre frequency transmitted | Assumed adjacent channel carrier (informative) | Filter on the adjacent channel frequency and corresponding filter bandwidth | ACLR limit |
| 5, 10, 15, 20 | BWChannel | NR of same BW (Note 2) | Square (BWConfig) | 24 |
|  | 2 x BWChannel | NR of same BW (Note 2) | Square (BWConfig) | [24] |
| NOTE 1: BWChannel and BWConfig are the *SAN channel bandwidth* and *transmission bandwidth configuration* of the *lowest/highest carrier* transmitted on the assigned channel frequency.  NOTE 2: With SCS that provides largest transmission bandwidth configuration (BWConfig). | | | | |

The ACLR absolute limit is specified in table 6.6.3.2‑2.

Table 6.6.3.2-2: SAN ACLR absolute limit

|  |  |
| --- | --- |
|  | ACLR absolute limit |
| Category A | -13 dBm/MHz |
| Category B | -15 dBm/MHz |

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