**3GPP TSG-RAN WG4 Meeting # 102-e R4-2203943**

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

Title: TP for TS 38.106：ON/OFF mask

Source: CATT

Agenda item: 10.5.1.3

Document for: Approval

# Background

This contribution provides a TP for ON/OFF mask requirements according to the discussion in our contribution [3] in this meeting.

# Reference

[1] R4-2115772, “Skeleton of TS 38.106”, CMCC

[2] R4-2203022, “WF on TDD Repeater Switching”, Ericsson, RAN4#101b-e

[3] R4-2203944, “Discussion on TDD repeater switching requirements”, CATT, RAN4#102e

# TP for TS 38.106-1:

<Begin of the TP>

6.10 Transmit ON/OFF power

6.10.1 Transmitter OFF power

6.10.1.1 General

Transmit OFF power requirements apply only to TDD operation of the repeater. The requirement applies to both downlink and uplink of the repeater.

Transmitter OFF power is defined as the mean power measured over 70/N us filtered with a square filter of bandwidth equal to the *transmission bandwidth configuration* of the repeater (BWConfig) centred on the assigned channel frequency during the *transmitter OFF period*. N = SCS/15, where SCS is Sub Carrier Spacing in kHz.

For *multi-band connectors* and for *single band connectors* supporting transmission in multiple *operating bands*, the requirement is only applicable during the *transmitter OFF period* in all supported *operating bands*.

6.10.1.2 Minimum requirement for *repeater type 1-C*

For repeater *type 1-C downlink*, the requirements for transmitter OFF power spectral density shall be less than -85 dBm/MHz per *antenna connector*.

For repeater *type 1-C uplink*, the requirements for transmitter OFF power spectral density shall be less than -50dBm / (SCS\*(12\*NRB+1)/1000) MHz per *antenna connector,* where SCS is Sub Carrier Spacing in kHz.

6.10.2 *Transmitter transient period*

6.10.2.1 General

*Transmitter transient period* requirements apply only to TDD operation of the repeater. The requirement applies to both downlink and uplink of the repeater.

The *transmitter transient period* is the time period during which the transmitter is changing from the *transmitter OFF period* to the *transmitter ON period* or vice versa. The *transmitter transient period* is illustrated in figure 6.10.2.1-1.



**Figure 6.10.2.1-1: Example of relations between transmitter ON period, transmitter OFF period and *transmitter transient period***

For *repeater type 1-C* this requirement shall be applied at the *antenna connector* supporting transmission in the *operating ban*d. [The beginning and end point of downlink and uplink bursts are referenced to the slot timing at the input.]

6.10.2.2 Minimum requirement for repeater *type 1-C*

For repeater *type 1-C*, the *transmitter transient period* shall be shorter than the values listed in the minimum requirement table 6.10.2.2-1.

**Table 6.10.2.2-1: Minimum requirement for the *transmitter transient period* for *repeater type 1-C***

|  |  |
| --- | --- |
| **Transition** | **Transient period length (µs)** |
| OFF to ON | 10 |
| ON to OFF | 10 |

<Next part>

7.10 OTA transmit ON/OFF power

7.10.1 General

OTA transmit ON/OFF power requirements apply only to TDD operation of NR repeater. The requirements apply to both downlink and uplink of the repeater.

7.10.2 OTA transmitter OFF power

7.10.2.1 General

OTA transmitter OFF power is defined as the mean power measured over 70/N µs filtered with a square filter of bandwidth equal to the *transmission bandwidth configuration* of the repeater (BWConfig) centred on the assigned channel frequency during the *transmitter OFF period*. N = SCS/15, where SCS is Sub Carrier Spacing in kHz.

For *multi-band* *RIBs* and *single band RIBs* supporting transmission in multiple bands, the requirement is only applicable during the *transmitter OFF period* in all supported *operating bands*.

7.10.2.3 Minimum requirement for *repeater type 2-O*

The OTA transmitter OFF TRP spectral density for *repeater type 2-O* shall be less than ‑36 dBm/MHz.

7.10.3 OTA transient period

7.10.3.1 General

The OTA *transmitter transient period* is the time period during which the transmitter is changing from the tra*nsmitter OFF period* to the *transmitter ON period* or vice versa. The *transmitter transient period* is illustrated in figure 7.10.3.1-1.



**Figure 7.10.3.1-1: Example of relations between transmitter ON period, transmitter OFF period and *transmitter transient period***

This requirement shall be applied at each RIB supporting transmission in the *operating band*. [The beginning and end point of downlink and uplink bursts are referenced to the slot timing at the input.]

7.10.3.2 Minimum requirement for *repeater type 2-O*

For *repeater type 2-O*, the OTA *transmitter transient period* shall be shorter than the values listed in the minimum requirement table 7.10.3.2-1.

**Table 7.10.3.2-1: Minimum requirement for the OTA *transmitter transient period* for *repeater type 2-O***

|  |  |
| --- | --- |
| **Transition** | **Transient period length (µs)** |
| OFF to ON | 3 |
| ON to OFF | 3  |

<End of the TP>