**3GPP TSG-RAN WG4 Meeting # 104bis-e R4-22xxxxx**

**Electronic Meeting, October 10 – October 19, 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.106** | **CR** | **-** | **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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Draft CR for 38.106 radiated related requirements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CMCC | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_repeaters-Core | | | | |  | ***Date:*** | | | 2022-9-28 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. For OOB gain requirements, received signal beam related description is missing 2. For ACRR requirements, one issue, i.g. the subclause for general requirements and minimum requirements should be parallel. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Add received signal beam related description for OOB gain requirements in 7.4.2 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | 1. Minimum requirements is updated as 7.8.2 from 7.8.1.1. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.4, 7.8 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

7.4 OTA out of band gain

7.4.1 General

Out of band gain refers to the gain of the repeater outside the *passband*.

The requirement is based on the ratio of TRP output power to directional input power.

The intended use of a repeater in a system is to amplify the in-band signals and not to amplify signals outside of the *passband*.

In the intended application of the repeater, the out of band gain is less than lowest expected the coupling loss to the nearest source of emissions.

7.4.2 Minimum requirement

The requirement shall apply at the RIB when the AoA of the incident wave of a received signal in the *passband* and a received signal on an adjacent channel outside repeater *passband* is from the same direction and are the same as the TX reference direction for the opposite DL/UL setting*.*

The gain outside the *passband* shall not exceed the maximum level specified in table 7.4.2-1, where:

- f\_offset\_CW is the offset between the outer channel edge frequency of the outer channel in the *passband* and a CW signal.

**Table 7.4.2-1: Out of band gain limits 1**

|  |  |
| --- | --- |
| **Frequency offset, f\_offset\_CW** | **Maximum gain** |
| 0.1\*Minimum {400MHz, *passband* BW}  f\_offset\_CW < 150 MHz | 68 dB |
| 150 MHz  f\_offset\_CW < 400 MHz | 55 dB |
| 400 MHz  f\_offset\_CW < f\_offset\_max | 35 dB |

## 7.8 OTA Adjacent Channel Rejection Ratio (ACRR)

### 7.8.1 General

OTA Adjacent Channel Rejection Ratio (ACRR) is the ratio of the average gain over a carrier of the repeater in the *passband* to the average gain of the repeater over an adjacent channel outside the repeater *passband*. The requirement shall apply to the uplink and downlink of the Repeater. The bandwidth of the channel inside the *passband* and the adjacent channel are assumed to be minimum {400MHz, *passband* BW}.

The requirement is differentiated between downlink and uplink.

The requirement shall apply during the *transmitter ON state*.

The ACRR is a ratio of gain in the adjacent channel to gain in the wanted channel. The gain in each case is defined as the ratio of TRP output power to directional input power.

### 7.8.2 Minimum Requirements

The requirement shall apply at the RIB when the AoA of the incident wave of a received signal in the *passband* and a received signal on an adjacent channel outside repeater *passband* is from the same direction and are the same as the TX reference direction for the opposite DL/UL setting*.*

For a repeater operating at *passband* operating in FR2, the ACRR requirements in table 7.8.2-1 shall apply in downlink. In normal conditions the ACRR for downlink shall be higher than the value specified in the Table 7.8.2-1.

**Table 7.8.2-1: Repeater Downlink ACRR**

|  |  |  |  |
| --- | --- | --- | --- |
| Co-existence with other systems | Repeater Class | Channel offset from frequency edge of *passband* (MHz) | ACRR limit |
| NR | Wide Area repeater | minimum {400MHz, *passband* BW}/2 | 28 (Note 2)  26 (Note 3) |
| Medium Range repeater | minimum {400MHz, *passband* BW}/2 | 28 (Note 2)  26 (Note 3) |
| Local Area repeater | minimum {400MHz, *passband* BW}/2 | 28 (Note 1, 2)  26 (Note 1, 3) |
| NOTE 1: This requirement does not applicable if the *passband* occupies the entire *operating band*.  NOTE 2: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz.  NOTE 3: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz | | | |

For a repeater operating at *passband* operating in FR2, the ACRR requirements in table 7.8.2-2 shall apply in uplink. In normal conditions the ACRR for uplink shall be higher than the value specified in the Table 7.8.2-2.

**Table 7.8.2-2: Repeater Uplink ACRR**

|  |  |  |  |
| --- | --- | --- | --- |
| Co-existence with other systems | Repeater Class | Channel offset from frequency edge of *passband* (MHz) | ACRR limit |
| NR | Wide Area repeater | minimum {400MHz, *passband* BW}/2 | 28 (Note 2)  26 (Note 3) |
| Local Area repeater | minimum {400MHz, *passband* BW}/2 | 17 (Note 1, 2)  16 (Note 1, 3) |
| NOTE 1: This requirement does not applicable if the *passband* occupies the entire *operating band*.  NOTE 2: Applicable to bands defined within the frequency spectrum range of 24.25 – 33.4 GHz.  NOTE 3: Applicable to bands defined within the frequency spectrum range of 37 – 52.6 GHz | | | |