**3GPP TSG- Meeting #**

**Maastricht, Netherlands, 19th – 23rd August, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **0089** | **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:*** | , Murata | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_netcon\_repeater-Core | | | | |  | ***Date:*** | | | 9 |
|  |  | | | |  | |  | | |  |
| ***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 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Requirement set applicability table has errors.  Clause titles for receiver spurious emissions for NCR-MT need corrections.  In clause 6.2.3, there is a duplicated sentence with other clause. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Modify the requirement set applicability table.  Correct clause titles for receiver spurious emissions.  The duplicated sentence is removed from clause 6.2.3. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Requirement set applicability table remains incomplete.  Clause titales are not aligned with the requirement set applicability table. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.5, 6.2.3, 6.22, 7.17 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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

## 4.5 Applicability of requirements

In Table 4.5-1, the requirement applicability for each requirement set is defined. For each requirement, the applicable requirement clause in the specification is identified. Requirements not included in a requirement set is marked not applicable (NA).

Table 4.5-1: *Requirement set* applicability

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement | Requirement set | | | | | |
|  | *Repeater*  *type 1-C,*  *NCR-Fwd*  *type 1-C* | *NCR-Fwd*  *type 1-H* | *NCR-MT type 1-C* | *NCR-MT type 1-H* | *Repeater type 2-O, NCR-Fwd type 2-O* | *NCR-MT type 2-O* |
| Repeater output power | 6.2 | 6.2 |  |  |  |  |
| Frequency stability | 6.3 | 6.3 |  |  |  |  |
| Out of band gain | 6.4 | 6.4 |  |  |  |  |
| Unwanted emissions | 6.5 | 6.5 |  |  |  |  |
| Repeater Error Vector Magnitude | 6.6 | 6.6 | NA | NA | NA |  |
| Input intermodulation | 6.7 | 6.7 |  |  |  |  |
| Output intermodulation | 6.8 | 6.8 |  |  |  |  |
| Adjacent Channel Rejection Ratio (ACRR) | 6.9 | 6.9 |  |  |  |  |
| Transmit ON/OFF power | 6.10 | 6.10 |  |  |  |  |
| Repeater output power for NCR-MT |  |  | 6.2.3.2 | 6.2.3.2 |  |  |
| Output power dynamics for NCR-MT |  |  | 6.11 | 6.11 |  |  |
| Transmit signal quality for NCR-MT |  |  | 6.12 | 6.12 |  |  |
| Unwanted emissions for NCR-MT |  |  | 6.5 | 6.5 |  | NA |
| Transmit intermodulation for NCR-MT |  | NA | 6.13 | 6.13 |  |  |
| Diversity characteristics for NCR-MT |  |  | 6.15 | 6.15 |  |  |
| Reference sensitivity for NCR-MT |  |  | 6.16 | 6.16 |  |  |
| Maximum input level for NCR-MT |  |  | 6.17 | 6.17 |  |  |
| Adjacent channel selectivity for NCR-MT |  |  | 6.18 | 6.18 |  |  |
| Blocking characteristics for NCR-MT |  |  | 6.19 | 6.19 |  |  |
| Spurious response for NCR-MT |  |  | 6.20 | 6.20 |  |  |
| Receiver intermodulation characteristics for NCR-MT |  |  | 6.21 | 6.21 |  |  |
| Receiver spurious emissions for NCR-MT |  |  | 6.22 | 6.22 |  |  |
| Performance requirements for NCR-MT |  |  | 8 | 8 |  |  |
| OTA Repeater output power |  | 7.2 |  |  | 7.2 |  |
| OTA frequency stability |  |  |  |  | 7.3 |  |
| OTA out of band gain |  |  |  |  | 7.4 |  |
| OTA unwanted emissions |  |  |  |  | 7.5 |  |
| OTA Repeater Error Vector Magnitude | NA |  |  | NA | 7.6 |  |
| OTA input intermodulation |  |  |  |  | 7.7 |  |
| OTA Adjacent Channel Rejection Ratio (ACRR) |  |  |  |  | 7.8 |  |
| OTA transmit ON/OFF power |  |  |  |  | 7.9 |  |
| OTA repeater output power for NCR-MT |  | NA | NA | 7.2 |  | 7.2 |
| OTA output power dynamics for NCR-MT |  |  |  |  |  | 7.10 |
| OTA transmit signal quality for NCR-MT |  |  |  |  |  | 7.11 |
| OTA unwanted emissions for NCR-MT |  |  |  |  |  | 7.5 |
| OTA diversity characteristics for NCR-MT |  |  |  |  |  | 7.12 |
| OTA reference sensitivity for NCR-MT |  |  |  | NA | NA | 7.13 |
| OTA maximum input level for NCR-MT |  |  |  |  |  | 7.14 |
| OTA adjacent channel selectivity for NCR-MT |  |  |  |  |  | 7.15 |
| OTA blocking characteristics for NCR-MT |  |  |  |  |  | 7.16 |
| OTA receiver spurious emissions for NCR-MT |  |  |  |  |  | 7.17 |
| Radiated performance requirements for NCR-MT |  |  |  |  |  | 9 |

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

### 6.2.3 Minimum requirement for NCR

#### 6.2.3.1 Minimum requirement for NCR-Fwd

##### 6.2.3.1.1 Minimum requirement for NCR-Fwd type 1-C

The requirements shall apply with NR signals in the *passband* of the NCR-Fwd at:

The lowest input power (Pin,p,AC) that produces the *rated passband output power* (Prated,p,AC).

Up to:

The lowest input power (Pin,p,AC) that produces the *rated passband output power* (Prated,p,AC), plus 10dB

In normal conditions, the measured output power, Pmax,p,AC shall remain within +2 dB and -2 dB of the *rated passband output power* Prated,p,AC, declared by the manufacturer.

In extreme conditions, the measured output power, Pmax,p,AC shall remain within +2.5 dB and -2.5 dB of the *rated passband output power* Prated,p,AC, declared by the manufacturer.

##### 6.2.3.1.2 Minimum requirement for NCR-Fwd type 1-H

The requirements shall apply with NR signals in the *passband* of the NCR-Fwd at:

The lowest input power (Pin,p,TABC) that produces the *rated passband output power* (Prated,p,TABC).

Up to:

The lowest input power (Pin,p,TABC) that produces the *rated passband output power* (Prated,p,TABC), plus 10dB

In normal conditions, the measured output power, Pmax,p,TABC shall remain within +2 dB and -2 dB of the *rated passband output power* Prated,p,TABC, declared by the manufacturer.

In extreme conditions, the measured output power, Pmax,p,TABC shall remain within +2.5 dB and -2.5 dB of the *rated passband output power* Prated,p,TABC, declared by the manufacturer.

#### 6.2.3.2 Minimum requirement for NCR-MT

##### 6.2.3.2.1 General

The NCR-MT conducted output power requirement is at *antenna connector* for *NCR-MT type 1-C*, or at *TAB connector* for *NCR-MT* *type 1-H*.

The *rated carrier output power* of the *NCR-MT type 1-C* shall be as specified in table 6.2.3.2.1-1.

Table 6.2.3.2.1-1: *NCR-MT type 1-C* UL transmission classes rated output power limits

|  |  |
| --- | --- |
| Repeater class | Prated,c,AC |
| Wide Area NCR-MT | (Note) |
| Local Area NCR-MT | ≤ 24 dBm |
| NOTE: There is no upper limit for the Prated,c,AC *rated output power* of the Wide Area NCR-MT. | |

The *rated carrier output power* of the *NCR-MT* *type 1-H* shall be as specified in table 6.2.3.2.1-2.

Table 6.2.3.2.1-2: *NCR-MT type 1-H* UL transmission classes rated output power limits

| Repeater class | Prated,c,sys | Prated,c,TABC |
| --- | --- | --- |
| Wide Area NCR-MT | (Note 1) | (Note 1) |
| Local Area NCR-MT2,3 | ≤ 24 dBm +10log(NTXU,counted) | ≤ 24 dBm |
| NOTE 1: There is no upper limit for the Prated,c,AC *rated output power* of the Wide Area NCR-MT.  NOTE 2: LA MT cannot exceed highest power class for that band as specified in TS 38.101-1.  NOTE 3: NTXU,counted = min(NTXU,active ,4) | | |

##### 6.2.3.2.2 Minimum requirement for NCR-MT type 1-C and NCR-MT type 1-H

In normal conditions, Pmax,c,AC shall remain within +2 dB and -2 dB of the *rated carrier output power* Prated,c,AC, declared by the manufacturer.

In extreme conditions, Pmax,c,AC shall remain within +2.5 dB and -2.5 dB of the *rated carrier output power* Prated,c,AC, declared by the manufacturer.

## 6.3 Frequency stability

### 6.3.1 General

Frequency stability is the ability to maintain the same frequency on the output signal with respect to the input signal.

### 6.3.2 Minimum requirement for RF repeater

The frequency deviation of the output signal with respect to the input signal shall be no more than ±0,01 PPM.

### 6.3.3 Minimum requirement for NCR

#### 6.3.3.1 Minimum requirement for NCR-Fwd

##### 6.3.3.1.1 Minimum requirement for NCR-Fwd type 1-C

The frequency deviation of the output signal with respect to the input signal shall be no more than ±0,01 PPM.

##### 6.3.3.1.2 Minimum requirement for NCR-Fwd type 1-H

The frequency deviation of the output signal with respect to the input signal between corresponding input/output TAB connectors shall be no more than ±0,01 PPM.

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

## 6.22 Receiver spurious emissions for NCR-MT

### 6.22.1 General

The receiver spurious emissions power is the power of emissions generated or amplified in a receiver unit that appear at the *antenna connector for NCR-MT type 1-C* and at *the TAB connector for NCR-MT type 1-H*. The requirements apply to all NCR-MT with separate RX and TX *TAB connectors*.

For *TAB connectors* supporting both RX and TX in TDD, the requirements apply during the *transmitter OFF period*.

For RX-only *multi-band* *connectors*, the spurious emissions requirements are subject to exclusion zones in each supported *operating band*. For *multi-band* *connectors* that both transmit and receive in *operating band* supporting TDD, RX spurious emissions requirements are applicable during the *TX OFF period*, and are subject to exclusion zones in each supported *operating band*.

For *NCR-MT type 1-H* manufacturer shall declare *TAB connector RX min cell groups*. Every *TAB connector* of *-NCR-MT type 1-H* supporting reception in an *operating band* shall map to one *TAB connector RX min cell group*, where mapping of *TAB connectors* to cells/beams is implementation dependent.

The number of active receiver units that are considered when calculating the conducted RX spurious emission limits (NRXU,counted) for Wide Area *NCR-MT type 1-H* is calculated as follows:

NRXU,counted = min(NRXU,active , 8 )

NOTE: NRXU,active is the number of actually active receiver units .

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

## 7.17 OTA receiver spurious emissions for NCR-MT

### 7.17.1 General

The receiver spurious emissions power is the power of emissions generated or amplified in a receiver. The receiver spurious emissions power level is measured as TRP.

### 7.17.2 Minimum requirement for NCR-MT type 2-O

The wide area NCR-MT receiver spurious emission requirement is specified the same as the Wide Area IAB-MT receiver spurious emission requirement in TS 38.174 [22], subclause 10.7.3.2.

The local area NCR-MT receiver spurious emission requirement is specified the same as receiver spurious emission requirement in TS 38.101-2 [14], subclause 7.9.

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