3GPP TSG-RAN WG4 Meeting #111 revision of R4-2409564

Fukuoka City, Fukuoka, Japan, 20th – 24th May, 2024

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  |
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| *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 to TS 38.115-1: Clauses 6.16~6.20 |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_netcon\_repeater-Perf |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *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:*** | Based on Draft BigCR to TS 38.115-1 which was Endorsed in R4-2406135, in this Draft CR we provide further updates to clauses 6.16~6.20. |
|  |  |
| ***Summary of change:*** | Clauses 6.16~6.20 |
|  |  |
| ***Consequences if not approved:*** | Missing NCR requirements.  |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  |  |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

<Start of Change>

# 6 Conducted characteristics

## 6.1 General

Unless otherwise stated, the conducted characteristics are specified at the *antenna connector* for *repeater type 1-C* *and NCR type 1-C configuration,* and atthe individual or groups of *TAB connectors* at the *transceiver array boundary* for *NCR type 1-H* configuration in normal operating conditions.

Requirements apply in both DL and UL.

For repeater type 1-C, NCR type 1-C, NCR type 1-H , the DL the *antenna connectors* / *TAB connectors* on the BS side is the input and the *antenna connector* on the UE side is the output.

For repeater type 1-C, NCR type 1-C, NCR type 1-H , the UL the *antenna connectors* / *TAB connectors* on the UE side is the input and the *antenna connector* on the BS side is the output.

General test conditions for conducted tests of the *repeater type 1-C, NCR type 1-C or NCR type 1-H* are given in clause 4, including interpretation of measurement results and configurations for testing. Repeater configurations for the tests are defined in clause 4.5.

If a number of *single-band connectors*, or *multi-band connectors* have been declared equivalent (D.13), only a representative one is necessary to be tested to demonstrate conformance.

For *BS type 1-H* if a number of *TAB connectors* have been declared equivalent (D.32), only a representative one is necessary to demonstrate conformance.

<Start of Change>

## 6.16 Conducted adjacent channel selectivity

### 6.16.1 Definition and applicability

Adjacent channel selectivity (ACS) is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency at the antenna connector for NCR-MT type 1-C or TAB connector for NCR-MT type 1-H in the presence of an adjacent channel signal with a specified centre frequency offset of the interfering signal to the band edge of a victim system.

This requirement applies to NCR-MT.

### 6.16.2 Minimum requirement

The minimum requirement for NCR-MT type 1-C is defined in TS 38.106 [2] clause 6.18.1.2.

The minimum requirement for NCR-MT type 1-H is defined in TS 38.106 [2] clause 6.18.1.3.

### 6.16.3 Test purpose

The test purpose is to verify the ability of the NCR receiver filter to suppress interfering signals in the channels adjacent to the wanted channel.

### 6.16.4 Method of test

##### 6.16.4.1 Initial conditions

Test environment: Normal; see annex B.2.

RF channels to be tested for single carrier (SC): M; see clause 4.9.1.

*Repeater RF Bandwidth p*ositions to be tested for multi-carrier (MC):

- MRFBW for *single-band connector(s)*, see clause 4.9.1,

- BRFBW\_T'RFBW and B'RFBW\_TRFBW for *multi-band connector(s),* see clause 4.9.1.

##### 6.16.4.2 Procedure

The minimum requirement is applied to all connectors under test.

For *NCR type 1-H* the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested; see clause 6.1.

1) Connect the connector under test to measurement equipment as shown in annex D.13.

2) For FDD operation, set the NCR to transmit:

- For single carrier operation set the connector under test to transmit at manufacturers declared r*ated output power per passband* (D.9).

- For a connector under test declared to be capable of multi-carrier operation (D.x) set the connector under test to transmit on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7 and 4.8 using the corresponding test models or set of physical channels in clause 4.9.2.

3) Set the signal generator for the wanted signal to transmit as specified in:

- table 6.16.5-1 for WA NCR-MT type 1-C and for WA NCR-MT type 1-H.

- xx for LA NCR-MT type 1-C or for LA NCR-MT type 1-H.

4) Set the signal generator for the interfering signal to transmit at the frequency offset and as specified in

- table 6.16.5-1 and 6.16.5-2, for WA NCR-MT type 1-C or for WA NCR-MT type 1-H.

- xx for LA NCR-MT type 1-C or for LA NCR-MT type 1-H.

5) Measure the throughput according to TS 38.106 [2] annex B.1.5.

In addition, for a *multi-band* *connector*, the following steps shall apply:

6) For *multi-band* *connector* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

### 6.16.5 Test requirements for WA NCR

This requirement applies to WA NCR-MT type 1-C, or WA NCR-MT type 1-H.

NCR throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel as specified in TS 38.106 annex B.1.5. Conducted requirement is defined at *antenna connector* of *NCR type 1-C*, or at *TAB connector of NCR type 1-H.*

The wanted and the interfering signal coupled to the *NCR type 1-C* *antenna connector* or *BS type 1-H* *TAB connector* are specified in table 6.16.5-1 and the frequency offset between the wanted and interfering signal in table 6.16.5-2. The reference measurement channel for the wanted signal is identified in table 7.2.5-1, 7.2.5-2 and 7.2.5-3 for each channel bandwidth in any operating band are specified in annex A.1. The characteristics of the interfering signal is further specified in annex E.

The ACS requirement is applicable outside the *repeater RF bandwidth*. The interfering signal offset is defined relative to the *repeater RF bandwidth* edges.

For NCR operating in non-contiguous spectrum within any *operating band*, the ACS requirement shall apply in addition inside any sub-block gap, in case the sub-block gap size is at least as wide as the NR interfering signal in table 6.16.5-2. The interfering signal offset is defined relative to the sub-block edges inside the sub-block gap.

For a *multi-band connector*, the ACS requirement shall apply in addition inside any Inter RF Bandwidth gap, in case the Inter RF Bandwidth gap size is at least as wide as the NR interfering signal in table 6.16.5‑2. The interfering signal offset is defined relative to the repeater RF bandwidth edges inside the Inter RF bandwidth gap.

Table 6.16.5-1: WA NCR-MT ACS requirement

|  |  |  |
| --- | --- | --- |
| *Channel bandwidth* of the lowest/highest carrier received (MHz) | Wanted signal mean power (dBm) | Interfering signal mean power (dBm) |
| 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 | PREFSENS + 6 dB | -52 |
| NOTE 1: The SCS for the lowest/highest carrier received is the lowest SCS supported by the NCR-MT for that bandwidth.NOTE 2: PREFSENS depends on the *channel bandwidth*. |

Table 6.16.5-2: WA NCR-MT ACS interferer frequency offset values

|  |  |  |
| --- | --- | --- |
| *Channel bandwidth* of the lowest/highest carrier received (MHz) | Interfering signal centre frequency offset from the lower/upper *repeater RF bandwidth* edge or sub-block edge inside a sub-block gap (MHz) | Type of interfering signal |
| 5 | ±2.5025 | 5 MHz DFT-s-OFDM NR signal,15 kHz SCS, 25 RBs |
| 10 | ±2.5075 |
| 15 | ±2.5125 |
| 20 | ±2.5025 |
| 25 | ±9.4675 | 20 MHz DFT-s-OFDM NRsignal, 15 kHz SCS, 100 RBs |
| 30 | ±9.4725 |
| 35 | ±9.4625 |
| 40 | ±9.4675 |
| 45 | ±9.4725 |
| 50 | ±9.4625 |
| 60 | ±9.4725 |
| 70 | ±9.4675 |
| 80 | ±9.4625 |
| 90 | ±9.4725 |
| 100 | ±9.4675 |

### 6.16.6 Test requirements for LA NCR

This requirement applies to LA NCR-MT type 1-C, or LA NCR-MT type 1-H.

The NCR throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel as specified in TS 38.106 [2] annex B.1.5.

## 6.17 Conducted blocking characteristics

### 6.17.1 Definition and applicability

The in-band blocking characteristics is a measure of the receiver's ability to receive a wanted signal at its assigned channel at the *TAB connector* for *NCR type 1-C* and *NCR 1-H* in the presence of an unwanted interferer, which is an NR signal for general blocking or an NR signal with one resource block for narrowband blocking.

Conducted blocking characteristics requirement applies only to NCR-MT connectors.

### 6.17.2 Minimum requirement

The minimum requirement for MT connectors of *NCR type 1-C* is defined in TS 38.106 [2] clause 6.19.2.

The minimum requirement for MT connectors of *NCR type 1-H* is defined in TS 38.106 [2] clause 6.19.3.

### 6.17.3 Test purpose

The test purpose is to verify the ability of the NCR receiver (at MT connectors) to withstand high-levels of in-band interference from unwanted signals at specified frequency offsets without undue degradation of its sensitivity.

### 6.17.4 Method of test

#### 6.17.4.1 Initial conditions

Test environment: Normal; see annex B.2.

RF channels to be tested for single carrier (SC): M; see clause 4.9.1.

*Repeater RF Bandwidth p*ositions to be tested for multi-carrier (MC):

- MRFBW for *single-band connector(s)*, see clause 4.9.1,

- BRFBW\_T'RFBW and B'RFBW\_TRFBW for *multi-band connector(s),* see clause 4.9.1.

NOTE: When testing in M (or MRFBW), if the interferer is fully or partially located outside the supported frequency range, then the test shall be done instead in B (or BRFBW) and T (or TRFBW), and only with the interferer located inside the supported frequency range.

#### 6.17.4.2 Procedure for general blocking

Test procedure below applies to WA class of *NCR type 1-C* and *NCR type 1-H.* For test procedure of LA class of *NCR type 1-C*, refer to TS 38.521-1 [x]. This test procedure apllies only at MT connectors.

The minimum requirement is applied to all connectors under test.

For *NCR type 1-H* the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested; see clause 7.1.

1) Connect the connector under test to measurement equipment as shown in annex D.x for *NCR type 1-C*, and in annex D.x *NCR type 1-H*.

2) For FDD operation, set the NCR to transmit:

- For single carrier operation set the connector under test to transmit at manufacturers declared *rated output power per passband* (D.9).

- For a connector under test declared to be capable of multi-carrier operation (D.7) set the connector under test to transmit on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7 and 4.8 using the corresponding test models or set of physical channels in clause 4.9.2.

3) Set the signal generator for the wanted signal to transmit as specified in table 6.17.5-2.

4) Set the signal generator for the interfering signal to transmit at the frequency offset and as specified in table 6.17.5-2. The interfering signal shall be swept with a step size of 1 MHz starting from the minimum offset to the channel edges of the wanted signals as specified in table 6.17.5-2.

5) Measure the throughput according to TS 38.106 [2] annex B.1.5.

In addition, for a *multi-band* *connector*, the following steps shall apply:

6) For *multi-band* *connector* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.

#### 6.17.4.3 Procedure for narrowband blocking

The minimum requirement is applied to all connectors under test.

For *NCR type 1-H* the procedure is repeated until all *TAB connectors* necessary to demonstrate conformance have been tested; see clause 7.1.

1) Connect the connector under test to measurement equipment as shown in annex D.x for *NCR type 1-C*, and in annex D.x for *NCR type 1-H*.

2) For FDD operation, set the MCR-MT to transmit:

- For single carrier operation set the connector under test to transmit at manufacturers declared *rated carrier output power* (D.9).

- For a connector under test declared to be capable of multi-carrier operation (D.7) set the connector under test to transmit on all carriers configured using the applicable test configuration and corresponding power setting specified in clauses 4.7 and 4.8 using the corresponding test models or set of physical channels in clause 4.9.2.

3) Set the signal generator for the wanted signal to transmit as specified in table 6.17.5-3.

4) Set the signal generator for the interfering signal to transmit at the frequency offset and as specified in table 6.17.5-3 and 6.17.5-4. Set-up and sweep the interfering RB centre frequency offset to the channel edge of the wanted signal according to table 6.17.5-4.

5) Measure the throughput according to TS 38.106 [2] annex B.1.5.

In addition, for a *multi-band* *connector*, the following steps shall apply:

### 6) For *multi-band* *connector* and single band tests, repeat the steps above per involved band where single band test configurations and test models shall apply with no carrier activated in the other band.6.17.5 Test requirements

The throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel, with a wanted and an interfering signal coupled to *antenna connector* of the *NCR type 1-C* or *TAB connector* of the *NCR type 1‑H* using the parameters in tables below. The reference measurement channel for the wanted signal is identified in clause 7.2.5 for each channel bandwidth and further specified TS 38.106 [2] annex B.1.5. The characteristics of the interfering signal is further specified in annex E.

The in-band blocking requirements apply outside the passband. The interfering signal offset is defined relative to the passband edge.

For *NCR type 1-C* and *NCR type 1-H,* the in-band blocking requirement applies from FUL\_low - ΔfOOB to FUL\_high + ΔfOOB, excluding the downlink frequency range of the *operating band*. The ΔfOOB is defined in table 6.17.5-1.

Minimum conducted requirement is defined at the MT *antenna connector* for *NCR type 1-C* and at the *TAB connector* for *NCR type 1-H.*

Table 6.17.5-1: ΔfOOB offset for NR *operating bands*

|  |  |  |
| --- | --- | --- |
| NCR type | *Operating band* characteristics | ΔfOOB (MHz) |
| *NCR type 1-C* | FUL\_high – FUL\_low ≤ 200 MHz | 20 |
|  | 200 MHz < FUL\_high – FUL\_low ≤ 900 MHz | 60 |
| *NCR type 1-H* | FUL\_high – FUL\_low < 100 MHz | 20 |
|  | 100 MHz ≤ FUL\_high – FUL\_low ≤ 900 MHz  | 60 |

For NCR operating in non-contiguous spectrum within any *operating band*, the in-band blocking requirements apply in addition inside any sub-block gap, in case the sub-block gap size is at least as wide as twice the interfering signal minimum offset in table 6.17.5-2. The interfering signal offset is defined relative to the sub-block edges inside the sub-block gap.

For a *multi-band connector*, the blocking requirements apply in the in-band blocking frequency ranges for each supported *operating band*. The requirement applies in addition inside any Inter RF Bandwidth gap, in case the Inter RF Bandwidth gap size is at least as wide as twice the interfering signal minimum offset in table 6.17.5-2.

For NCR operating in non-contiguous spectrum within any operating band, the narrowband blocking requirement applies in addition inside any sub-block gap, in case the sub-block gap size is at least as wide as the channel bandwidth of the NR interfering signal in table 6.17.5-4. The interfering signal offset is defined relative to the sub-block edges inside the sub-block gap.

For a *multi-band connector*, the narrowband blocking requirement applies in addition inside any Inter RF Bandwidth gap, in case the Inter RF Bandwidth gap size is at least as wide as the NR interfering signal in table 6.17.5-4. The interfering signal offset is defined relative to the passpand edges inside the Inter RF Bandwidth gap.

Table 6.17.5-2: NCR general blocking requirement

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Channel bandwidth* of the lowest/highest carrier received (MHz) | Wanted signal mean power (dBm) (Note 2) | Interfering signal mean power (dBm) | Interfering signal centre frequency minimum offset from the lower/upper passband edge or *inter-passband gap* (MHz) | Type of interfering signal |
|  |  |  |  |  |
| 5, 10, 15, 20 | PREFSENS + x dB | WA NCR: -43 | ±7.5 | 5 MHz DFT-s-OFDM NR signal, 15 kHz SCS, 25 RBs |
| 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 | PREFSENS + x dB | WA NCR: -43 | ±30 | 20 MHz DFT-s-OFDM NR signal, 15 kHz SCS, 100 RBs |
| NOTE 1: PREFSENS depends on the *channel bandwidth*. NOTE 2: For NCR capable of single band operation only, "x" is equal to 6 dB. For a NCR capable of multi-band operation, "x" is equal to 6 dB in case of interfering signals that are in the in-band blocking frequency range of the operating band where the wanted signal is present or in the in-band blocking frequency range of an adjacent or overlapping operating band. For other in-band blocking frequency ranges of the interfering signal for the supported operating bands, "x" is equal to 1.4 dB. |

Table 6.17.5-3: NCR narrowband blocking requirement

|  |  |  |
| --- | --- | --- |
| *Channel bandwidth* of the lowest/highest carrier received (MHz) | Wanted signal mean power (dBm) | Interfering signal mean power (dBm) |
| 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100(Note 1) | PREFSENS + 6 dB | WA NCR: -49 |
| NOTE 1: The SCS for the lowest/highest carrier received is the lowest SCS supported by NCR for that *channel bandwidth.*NOTE 2: PREFSENS depends on the *channel bandwidth*.NOTE 3: 7.5 kHz shift is not applied to the wanted signal. |

Table 6.17.5-4: NCR narrowband blocking interferer frequency offsets

|  |  |  |
| --- | --- | --- |
| *Channel bandwidth* of the lowest/highest carrier received (MHz) | Interfering RB centre frequency offset to the lower/upper passband edge or *inter-passband gap* (kHz)(Note 2) | Type of interfering signal |
| 5 | ±(350+m\*180),m=0, 1, 2, 3, 4, 9, 14, 19, 24 | 5 MHz DFT-s-OFDM NR signal, 15 kHz SCS, 1 RB |
| 10 | ±(355+m\*180),m=0, 1, 2, 3, 4, 9, 14, 19, 24 |  |
| 15 | ±(360+m\*180),m=0, 1, 2, 3, 4, 9, 14, 19, 24 |  |
| 20 | ±(350+m\*180),m=0, 1, 2, 3, 4, 9, 14, 19, 24 |  |
| 25 | ±(565+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 | 20 MHz DFT-s-OFDM NR signal, 15 kHz SCS, 1 RB |
| 30 | ±(570+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| 35 | ±(560+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| 40 | ±(565+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| 45 | ±(570+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| 50 | ±(560+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| 60 | ±(570+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| 70 | ±(565+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| 80 | ±(560+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| 90 | ±(570+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| 100 | ±(565+m\*180),m=0, 1, 2, 3, 4, 29, 54, 79, 99 |  |
| NOTE 1: Interfering signal consisting of one resource block positioned at the stated offset, the *channel bandwidth* of the interfering signal is located adjacently to the lower/upper passband edge or *inter-passband gap*.NOTE 2: The centre of the interfering RB refers to the frequency location between the two central subcarriers. |

## 6.18 Conducted spurious response

### 6.18.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency at the *antenna connector* for *NCR-MT type 1-C* or *TAB connector* for *NCR-MT type 1-H* in the presence of two interfering signals which have a specific frequency relationship to the wanted signal.

This requirement applies at MT connectors.

### 6.18.2 Minimum requirement

The minimum requirement for MT connectors of *NCR type 1-C* and *NCR type 1-H* is defined in TS 38.101-1 [x], clause 7.7.

### 6.18.3 Test purpose

Spurious response is a measure of the ability of the receiver to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency for which a response is obtained.

The lack of the spurious response ability decreases the coverage area when other unwanted interfering signal exists at any other frequency.

### 6.18.4 Method of test

For *NCR type 1-C* and *NCR type 1-H*, the test description for conducted spurious response is defined in TS 38.521-1 [x], clause 7.7.4. This test procedure applies at MT connectors only.

### 6.18.5 Test requirements

For *NCR type 1-C* and *NCR type 1-H*, the test requirement for conducted spurious response is defined in TS 38.521-1 [x], clause 7.7.5. This test requirement applies at MT connectors only.

## 6.19 Conducted intermodulation characteristics

### 6.19.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency at the antenna connector for *NCR-MT type 1-C* or *TAB connector* for *NCR-MT type 1-H* in the presence of two interfering signals which have a specific frequency relationship to the wanted signal.

This requirement applies at MT connectors only.

### 6.19.2 Minimum requirement

The minimum requirement for MT connectors of *NCR type 1-C* is defined in TS 38.106 [2] clause 6.21.2.

The minimum requirement for MT connectors of *NCR type 1-H* is defined in TS 38.106 [2] clause 6.21.3.

### 6.19.3 Test purpose

The test purpose is to verify the ability of the receiver to inhibit the generation of intermodulation products in its non-linear elements caused by the presence of two high-level interfering signals at frequencies with a specific relationship to the frequency of the wanted signal.

### 6.19.4 Method of test

For *NCR type 1-C* and *NCR type 1-H* of WA class, the test descrption for conducted intermodulation characteristics is defined in TS 38.141-1 [x], clause 7.7.4.

For *NCR type 1-C* and *NCR type 1-H* of LA class, the test descrption for conducted intermodulation characteristics is defined in TS 38.521-1 [x], clause 7.8.2.4. This test procedure applies at MT connectors only.

### 6.19.5 Test requirements

For *NCR type 1-C* and *NCR type 1-H* of WA class, the test requirement for conducted intermodulation characteristics is defined in TS 38.141-1 [x], clause 7.7.5.

For *NCR type 1-C* and *NCR type 1-H* of LA class, the test requirement for conducted intermodulation characteristics is defined in TS 38.521-1 [x], clause 7.8.2.5.

This test requirement applies at MT connectors only.

## 6.20 Conducted spurious emissions

### 6.20.1 Definition and applicability

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.

This requirement applies at MT connectors only.

### 6.20.2 Minimum requirement

The minimum requirement for MT connectors of NCR is defined in TS 38.106 [2] clause 6.22.2.

### 6.20.3 Test purpose

Test verifies that spurious emissions meets the test requirements described in clause 6.20.5. Excess spurious emissions increase the interference to other systems.

### 6.20.4 Method of test

For *NCR type 1-C* and *NCR type 1-H* of LA class, the test description for conducted spurious emissions is defined in TS 38.521-1 [x], clause 7.9.4.This test procedure applies at MT connectors only.

### 6.20.5 Test requirements

For *NCR type 1-C* and *NCR type 1-H* of LA class, the test requirement for conducted spurious emissions is defined in TS 38.521-1 [x], clause 7.9.5.

This test requirement applies at MT connectors only.