3GPP TSG-RAN WG4 Meeting #111 R4-2409566

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

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.114** | **CR** |  | **rev** | **1** | **Current version:** | **18.1.0** |  |
|  | | | | | | | | |
| *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 to TS 38.114: NCR inputs | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_NTN\_enh-Perf | | | | |  | ***Date:*** | | | 2024-05-13 |
|  |  | | | |  | |  | | |  |
| ***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 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:*** | | NCR inputs based on the worksplit. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | NCR inputs based on the worksplit: clause 4.3. 4.4, 4.5 | | | | | | | | |
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| ***Consequences if not approved:*** | | Missing NCR requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.3. 4.4, 4.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

*------------------------------ Modified section ------------------------------*

## 4.3 Narrow band responses

Responses on uplink or downlink occurring during the immunity test at discrete frequencies which are narrow band responses (spurious responses), are identified by the following method:

- if during an immunity test the quantity being monitored goes outside the specified tolerances (clause 6), it is necessary to establish whether the deviation is due to a narrow band response or to a wide band (EMC) phenomenon. Therefore, the test shall be repeated with the unwanted signal frequency increased, and then decreased by 2 x BWChannel MHz, where BWChannel is the channel bandwidth as defined in TS 38.106 [2], clause 5.3;

- if the deviation disappears in either one or both of the above MHz offset cases, then the response is considered as a narrow band response;

- if the deviation does not disappear, this may be due to the fact that the offset has made the frequency of the unwanted signal correspond to the frequency of another narrow band response. Under these circumstances the procedure is repeated with the increase and decrease of the frequency of the unwanted signal set to 2.5 x BWChannel MHz;

- if the deviation does not disappear with the increased and/or decreased frequency, the phenomenon is considered wide band and therefore an EMC problem and the equipment fails the test.

For immunity test narrow band responses are disregarded.

For EUT capable of multi-band operation, all supported *operating bands* shall be considered for narrowband responses.

## 4.4 Exclusion bands

The *exclusion band* for NR repeater is the frequency range over which no tests of radiated immunity are made in UL or DL.

The *exclusion band* for DL is defined as:

FDL,low – ΔfOBUE < f < FDL,high + ΔfOBUE

Where values of FDL,low and FDL,high are defined for each *operating band* in TS 38.106 [2], clause 5.2.

The *exclusion band* for UL is defined as:

FUL,low – ΔfOBUE < f < FUL,high + ΔfOBUE

Where values of FUL,low and FUL,high are defined for each *operating band* in TS 38.106 [2], clause 5.2.

For NR repeater capable of multi-band operation, the total *exclusion band* is a combination of the *exclusion bands* for each *operating band* supported by NR repeater.

The ΔfOBUE values are defined in table 4.4-1 for both DL and UL.

Table 4.4-1: ΔfOBUE offset values

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| --- | --- | --- |
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|  | *Operating band* characteristics | ΔfOBUE (MHz) |
| *NCR type 1-H* | FDL,high – FDL,low < 100 MHz, or  FUL,high – FUL,low < 100 MHz | 10 |
|  | 100 MHz ≤ FDL,high – FDL,low ≤ 900 MHz, or  100 MHz ≤ FUL,high – FUL,low ≤ 900 | 40 |
| Repeater type 1-C, | FDL,high – FDL,low < 200 MHz, or  FUL,high – FUL,low < 200 MHz | 10 |
| *NCR type 1-C* | 200 MHz ≤ FDL,high – FDL,low ≤ 900 MHz, or  200 MHz ≤ FUL,high – FUL,low ≤ 900 MHz | 40 |

NOTE: As the radiated immunity testing is defined in the frequency range 80 MHz to 6 GHz, there is no exclusion band defined for FR2.

## 4.5 NR repeaters test configurations

The present clause defines the NR repeaters test configurations that shall be used for demonstrating conformance. A single NR repeater carrier shall be used for testing of single-carrier capable NR repeaters.

The signal's channel bandwidth and subcarrier spacing used to build NR Test Configurations shall be selected according to table 4.7.2-1 in TS 38.115-1 [3] clause 4.7 for *NR repeaters type 1-C*, and table 4.7.2.1-1 in TS 38.115-2 [4] clause 4.7 for *NR repeaters type 2-O*. The passband frequency range declared per *operating band* in TS 38.115-1 [3] clause 4.6, and TS 38.115-2 [4] clause 4.6 shall be used.

For other NR repeaters, the test configurations in table 4.5-1 and table 4.5-2 shall be used. The NR repeaters test configurations (RTCx) are defined in TS 38.115-1 [3], clause 4.7 for *NR repeaters type 1-C* and in TS 38.115-2 [4], clause 4.7 for *NR repeaters type 2-O*.

Table 4.5-1: Test configurations for *NR repeaters type 1-C*

| Repeater test case | Repeater capable of single or multiple passbands in a single band | | | Repeater capable of multi-band operation | |
| --- | --- | --- | --- | --- | --- |
|  | Single passband repeater | Multiple passband capable repeater with identical parameters per passband | Multiple passband capable repeater with different parameters per passband | Common connector | Separate connectors |
| Emission tests | RTC1 | RTC1, RTC2 | RTC1, RTC2 | RTC1/2 (Note 1), RTC4 | RTC1/2 (Note 1, 2), RTC4 (Note 2) |
| Immunity tests | RTC1 | RTC1, RTC2 | RTC1, RTC2 | RTC1/2 (Note 1), RTC4 | RTC1/2 (Note 1, 2), RTC4 (Note 2) |
| NOTE 1: RTC1 and/or RTC2 shall be applied in each supported operating band.  NOTE 2: For single-band operation test, other antenna connector(s) is (are) terminated. | | | | | |

Table 4.5-2: Test configurations for *NR repeaters type 2-O*

| Repeater test case | Repeater capable of single or multiple passbands in a single band | | |
| --- | --- | --- | --- |
|  | Single passband repeater | Multiple passband capable repeater with identical parameters per passband | Multiple passband capable repeater with different parameters per passband |
| Emission tests | RTC1 | RTC1, RTC2 | RTC1, RTC2 |
| Immunity tests | RTC1 | RTC1, RTC2 | RTC1, RTC2 |

Table 4.5-3: Test configurations for *NCR type 1-C, NCR type 1-H*

| Repeater test case | Repeater capable of single or multiple passbands in a single band | | | Repeater capable of multi-band operation | |
| --- | --- | --- | --- | --- | --- |
|  | Single passband repeater | Multiple passband capable repeater with identical parameters per passband | Multiple passband capable repeater with different parameters per passband | Common connector | Separate connectors |
| Emission tests | NCRTC1 | NCRTC1, NCRTC2 | NCRTC1, NCRTC2 | NCRTC1/2 (Note 1), NCRTC4 | NCRTC1/2 (Note 1, 3), NCRTC4 (Note 3) |
| Immunity tests | NCRTC1 | NCRTC1, NCRTC2 | NCRTC1, NCRTC2 | NCRTC1/2 (Note 1), NCRTC4 | NCRTC1/2 (Note 1, 3), NCRTC4 (Note 3) |
| Note 1: NCRTC1 and/or NCRTC2 shall be applied in each supported operating band.  Note 2: NCRTC4 may be applied for Inter passband gap only.  Note 3: For single-band operation test, other antenna connector(s) is (are) terminated. | | | | | |

Table 4.5-4: Test configurations for *NCR type 2-O*

| Repeater test case | Repeater capable of single or multiple passbands in a single band | | |
| --- | --- | --- | --- |
|  | Single passband repeater | Multiple passband capable repeater with identical parameters per passband | Multiple passband capable repeater with different parameters per passband |
| Emission tests | NCRTC1 | NCRTC1, NCRTC2 | NCRTC1, NCRTC2 |
| Immunity tests | NCRTC1 | NCRTC1, NCRTC2 | NCRTC1, NCRTC2 |

*------------------------------ End of modified section -------------------------*