**3GPP TSG-RAN4 Meeting #102-e *R4-22005614***

**Electronic meeting, 21st Feb –3rd Mar 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-3** | **CR** | **-** | **rev** | **-** | **Current version:** | **15.16.0** |  |
|  | | | | | | | | |
| *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 | **x** | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Draft CR to correct the output power in EN-DC Rx tests | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Anritsu Limited | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | ***Date:*** | | | 2022-2-11 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-15 |
|  | *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:*** | | To prevent and decrease the affect on NR operation by IMD during EN-DC Rx test, the output power of the E-UTRA uplink shall be set to 29 dB below PCMAX\_L for all intra-band EN-DC tests, not only for intra-band non-contiguous EN-DC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Apply the general requirement about the output power to all intra-band EN-DC tests. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | IMD will affect the test channel, and may cause the incorrect test. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.1, 7.4B.1, 7.5B.1, 7.6B.2.1, 7.6B.3.1, 7.6B.4.1, 7.7B.1, 7.8B.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.521-3 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<<Unchaged sections skipped>>

# 7 Receiver characteristics

## 7.1 General

Unless otherwise stated the receiver characteristics are specified at the antenna connector(s) of the UE for the bands operating on frequency range 1 and over the air of the UE for the bands operating on frequency range 2. The requirements for frequency range 1 and frequency range 2 can be verified separately. For the carrier in frequency range 1, requirements can be verified with NR FR2 link disabled. For the carrier in frequency range 2, requirements can be verified in OTA mode with E-UTRA connecting to the network by OTA without calibration.

The requirements defined in this clause are the extra requirements compared with the single carrier requirements defined in TS 38.101-1 [2] and TS 38.101-2 [3].

Unless otherwise stated, the UL and DL reference measurement channels are the same with the configurations specified in TS 38.101-1 [2] and TS 38.101-2 [3].

Unless otherwise stated, requirements for NR receiver written in TS 38.101-1 [2] and TS 38.101-2 [3] apply and are assumed anchor agnostic. Requirements are verified under conditions where anchor resources do not interfere NR operation.

<<Start of change>>

For intra-band EN-DC, the output power is configured as follows:

- One E-UTRA uplink carrier with the output power set to 29 dB below PCMAX\_L and the NR band whose downlink is being tested has its uplink carrier output power set to 4 dB below PCMAX\_L,f,c.

- One NR uplink carrier with the output power set to 29 dB below PCMAX\_L,f,c and the E-UTRA band whose downlink is being tested has its uplink carrier output power set to 4 dB below PCMAX\_L,c.

<<End of change>>

For the additional requirements for intra-band non-contiguous EN-DC of two sub-blocks, an in-gap test refers to the case when the interfering signal is located at a negative offset with respect to the assigned lowest channel frequency of the highest sub-block and located at a positive offset with respect to the assigned highest channel frequency of the lowest sub-block.

For the additional requirements for intra-band non-contiguous EN-DC of two sub-blocks, an out-of-gap test refers to the case when the interfering signal(s) is (are) located at a positive offset with respect to the assigned channel frequency of the highest carrier frequency or located at a negative offset with respect to the assigned channel frequency of the lowest carrier frequency.

For the additional requirements for intra-band non-contiguous EN-DC of two sub-blocks with channel bandwidth larger than or equal to 5 MHz, the existing adjacent channel selectivity requirements, in-band blocking requirements (for each case), and narrow band blocking requirements apply for in-gap tests only if the corresponding interferer frequency offsets with respect to the two measured carriers satisfy the following condition in relation to the sub-block gap size Wgap for at least one of the E-UTRA or NR sub-blocks, so that the interferer frequency position does not change the nature of the core requirement tested:

Wgap ≥ 2∙|FInterferer (offset)| – BWChannel

For the E-UTRA sub-block, the FInterferer (offset), for a sub-block with a single component carrier is the interferer frequency offset with respect to carrier as specified in clause 7.5.1, clause 7.6.1 and clause 7.6.3 for the respective requirement in TS 36.101 [4] and BWChannel. FInterferer (offset) for the E-UTRA sub-block with two or more contiguous component carriers is the interference frequency offset with respect to the carrier adjacent to the gap is specified in clause 7.5.1A, 7.6.1A and 7.6.3A in TS 36.101 [4].

For the NR sub-block, the FInterferer (offset), for a sub-block with a single component carrier is the interferer frequency offset with respect to carrier as specified in clause 7.5.1, clause 7.6.1 and clause 7.6.3 for the respective requirement in TS 38.101-1 [2] and BWChannel.

The interferer frequency offsets for adjacent channel selectivity, each in-band blocking case and narrow-band blocking shall be tested separately with a single in-gap interferer at a time.

For sub-clauses with suffix A or B: the minimum requirements for band combinations including Band n41 also apply for the corresponding band combinations with Band n90 replacing Band n41 but with otherwise identical parameters. For brevity the said band combinations with Band n90 are not listed in the tables below but are covered by this specification.

For the requirements of FR1 in this clause, the UE shall be verified with four Rx antenna ports and skip two Rx antenna ports requirements in operating bands where the UE is equipped with four Rx antenna ports, otherwise, the UE shall be verified with two Rx antenna ports.

<<Start of change>>

## 7.4B Maximum input level for DC in FR1

### 7.4B.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC maximum input level requirement and parameters are defined in Table 7.4B.1-1.

Table 7.4B.1-1: Maximum Input

|  |  |
| --- | --- |
| **Power in Largest CC, E-UTRA or NR, dBm** | X1 |
| **Power in each other CC, dBm** | X1 – 10\*log10(NxSCSx/NySCSy) |
| NOTE 1: Power in Largest E-UTRA or NR bandwidth CC, listed in Table 7.4-1 [2]  NOTE 2: Nx, SCSx is the number of RB's and Sub carrier spacing in the largest carrier bandwidth and could be E-UTRA or NR carrier  NOTE 3: Ny, SCSy is the number of RB's in any other carrier.  NOTE 4: Void.  NOTE 5: Void. | |

## 7.5B Adjacent channel selectivity for DC in FR1

### 7.5B.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC ACS requirement and parameters are defined for test case 1 in Table 7.5B.1-1 and for test case 2 in Table 7.5B.1-2.

Table 7.5B.1-1: ACS test case 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EN-DC Aggregated Bandwidth, MHz | <=100 | >100, <=120 | >120, <=140 | >140, <=160 |
| ACS, dB | X1 | 19.2 | 18.5 | 17.9 |
| Pinterferer, dBm | PI 2 | Aggregated power + 17.7 dB | Aggregated power + 17 dB | Aggregated power + 16.4dB |
| Pw in Transmission BW configuration, per CC, dBm | REFSENS +14dB | | | |
| NOTE 1: X is ACS level at the specified EN-DC aggregated bandwidth from Table 7.5.1A-1 in TS 36.101 [4]  NOTE 2: PI is from Table 7.5.1A-2 in TS 36.101 [4]  NOTE 3: Jammer BW and offset is from Table 7.5.1A-2 [4] and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier  NOTE 4: Void.  NOTE 5: Void. | | | | |

Table 7.5B.1-2: ACS test case 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EN-DC Aggregated Bandwidth, ENBW, MHz** | ≤100 | >100, ≤120 | >120, ≤140 | >140, ≤160 |
| **Pw in Transmission Bandwidth Configuration, perCC, dBm** | PW 1 | -42.7 +10log10(NRB,c/ NRB\_agg) | -42 +10log10(NRB,c/ NRB\_agg) | -41.4 +10log10(NRB,c/ NRB\_agg) |
| **Pinterferer, dBm** | -25 | | | |
| NOTE 1: PW is wanted signal power level at the specified EN-DC aggregated Bandwidth from Table 7.5.1A-3 in TS 36.101 [4]  NOTE 2: Jammer BW and offset is from Table 7.5.1A-3 [4] and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier  NOTE 3: Void.  NOTE 4: Void. | | | | |

## 7.6B Blocking characteristics for DC in FR1

### 7.6B.1 General

### 7.6B.2 In-band blocking for DC in FR1

#### 7.6B.2.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC in-band blocking requirement and parameters are defined in Table 7.6B.2.1-1.

Table 7.6B.2.1-1: In-band blocking

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EN-DC Aggregated Bandwidth, MHz | ≤100 | >100, ≤120 | >120, ≤140 | >140, ≤160 |
| Pw in Transmission Bandwidth Configuration, perCC, dBm |  | REFSENS + Aggregated BW specific value below | | |
|  | PW 1 | 16.8 | 17.5 | 18 |
| NOTE 1: PW is wanted signal power level at the specified EN-DC aggregated Bandwidth from Table 7.6.1.1A-1 in TS 36.101 [4]  NOTE 2: Interferer values are specified from Table 7.6.1.1A-2 in TS 36.101 [4]  NOTE 3: Jammer BW and offset is from Table 7.6.1.1A-1 [4] and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier  NOTE 4: Void.  NOTE 5: Void. | | | | |

### 7.6B.3 Out-of-band blocking for DC in FR1

#### 7.6B.3.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC out-of-band requirement and parameters are defined in Table 7.6B.3.1-1.

Table 7.6B.3.1-1: Out-of-band blocking

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EN-DC Aggregated Bandwidth, MHz | ≤100 | >100, ≤120 | >120, ≤140 | >140, ≤160 |
| Pw in Transmission Bandwidth Configuration, perCC, dBm | REFSENS + Aggregated BW specific value below | | | |
|  | 9 | | | |
| NOTE 1: Interferer values and offsets are specified from Table 7.6.2.1A-2 in TS 36.101 [4]  NOTE 2: Void.  NOTE 3: Void. | | | | |

### 7.6B.4 Narrow band blocking for DC in FR1

#### 7.6B.4.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC narrow band blocking requirement and parameters are defined in Table 7.6B.4.1-1.

Table 7.6B.4.1-1: Narrow band blocking parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EN-DC Aggregated Bandwidth, MHz | ≤100 | >100, ≤120 | >120, ≤140 | >140, ≤160 |
| Pw in Transmission Bandwidth Configuration, perCC, dBm | REFSENS + Aggregated BW specific value below | | | |
|  | 16 | | | |
| PUW, dBm (CW) | -55 | | | |
| NOTE 1: Jammer offset is from Table 7.6.3.1A-1 [4] and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier  NOTE 2: Void.  NOTE 3: Void.  NOTE 4: If NR carrier BW > 40 MHz, no narrow band blocking requirements apply when blocker is applied at the edge of the NR carrier. | | | | |

## 7.7B Spurious response for DC in FR1

### 7.7B.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC spurious response requirement and parameters are defined in Table 7.7B.1-1.

Table 7.7B.1-1: Spurious Response Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EN-DC Aggregated Bandwidth, MHz | ≤100 | >100, ≤120 | >120, ≤140 | >140, ≤160 |
| Pw in Transmission Bandwidth Configuration, perCC, dBm | REFSENS + Aggregated BW specific value below | | | |
|  | 9 | | | |
| Pinterferer, dBm (CW) | -44 | | | |
| NOTE 1: Void.  NOTE 2: Void. | | | | |

## 7.8B Intermodulation characteristics for DC in FR1

### 7.8B.1 General

### 7.8B.2 Wide band Intermodulation

#### 7.8B.2.1 Intra-band contiguous EN-DC in FR1

Intra-band contiguous EN-DC wide band intermodulation requirement and parameters are defined in Table 7.8B.2.1-1.

Table 7.8B.2.1-1: Wide band intermodulation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EN-DC Aggregated Bandwidth, MHz | <=100 | >100, <=120 | >120, <=140 | >140, <=160 |
| Pw in Transmission Bandwidth Configuration, perCC, dBm | PW 1 | REFSENS + Aggregated BW specific value below | | |
|  |  | 16.8 | 17.5 | 18.0 |
| Pinterferer 1, dBm (CW)2 | -46 | | | |
| Pinterferer 2, dBm (Modulated)2 | -46 | | | |
| NOTE 1: PW is wanted signal power level from Table 7.8.1A-1 in TS 36.101 [4]  NOTE 2: Jammer BW and offsets is from Table 7.8.1A-1 [4] and is applied from the lowest edge of the lowest carrier and the highest edge of the highest carrier  NOTE 3: Void.  NOTE 4: Void. | | | | |

<<End of change>>