**3GPP TSG-RAN4 Meeting # 103-e *R4-2211273***

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.104** | **CR** | **4959** | **rev** | - | **Current version:** | **17.5.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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:*** | CR on adding B48 for M1/M2/NB1/NB2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_bands\_R17\_M1\_M2\_NB1\_NB2 | | | | |  | ***Date:*** | | | 2022-5-24 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Adding B48 for NB1/NB2 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding B48 related RF requirments for NB1/NB2 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Missing B48 support for NB1/NB2 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.5, 7.6.1.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **x** |  | Test specifications | | | | 36.141 | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## < start of changes >

## 5.5 Operating bands

E-UTRA is designed to operate in the operating bands defined in Table 5.5-1. Unless stated otherwise, requirements specified for the TDD duplex mode apply for downlink and uplink operations in Frame Structure Type 2 [4].

NB-IoT is designed to operate in the E-UTRA operating bands 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 14, 17, 18, 19, 20, 21, 24, 25, 26, 28, 31, 41 (in certain regions), 42, 43, 48, 65, 66, 70, 71, 72, 73, 74, 85, 87, 88 , 103 which are defined in Table 5.5-1.

## << Unchanged part is omitted>>

7.6.1.1 Minimum requirement

## << Unchanged part is omitted>>

For NB-IoT standalone operation, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel, with a wanted and an interfering signal coupled to BS antenna input using the parameters in Tables 7.6.1.1-3, 7.6.1.1-3a, 7.6.1.1-3b, 7.6.1.1-3c and 7.6.1.1-4. The reference measurement channel for the wanted signal is identified in Table 7.2.1-5, 7.2.1-5a, 7.2.1-5b and 7.2.1-5c and further specified in Annex A.

The blocking requirement is applicable outside the Base Station RF Bandwidth or Radio Bandwidth. The interfering signal offset is defined relative to the Base Station RF Bandwidth edges or Radio Bandwidth edges.

Table 7.6.1.1-3: Blocking performance requirement for Wide Area BS for NB-IoT standalone operation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Centre Frequency of Interfering Signal [MHz] | | | Interfering Signal mean power [dBm] | Wanted Signal mean power [dBm] | Interfering signal centre frequency minimum frequency offset from the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of Interfering Signal |
| 1-5, 7, 11, 13-14,18,19, 21, 24, 42, 43, 48, 65, 66, 70, 103 | (FUL\_low -20) | to | (FUL\_high +20) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 8, 26, 28 | (FUL\_low -20) | to | (FUL\_high +10) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +10) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 12 | (FUL\_low -20) | to | (FUL\_high +13) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +13) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 17 | (FUL\_low -20) | to | (FUL\_high +18) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +18) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 20, 71 | (FUL\_low -11) | to | (FUL\_high +20) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -11)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 25 | (FUL\_low -20) | to | (FUL\_high +15) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +15) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 31, 72, 73, 74, 87, 88 | (FUL\_low -20) | to | (FUL\_high +5) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +5) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 85 | (FUL\_low -20) | to | (FUL\_high +12) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +12) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| Note 1: PREFSENS is specified in Table 7.2.1-5.  Note 2: Up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size. | | | | | | | |

Table 7.6.1.1-3a: Blocking performance requirement for Local Area BS for NB-IoT standalone operation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Centre Frequency of Interfering Signal [MHz] | | | Interfering Signal mean power [dBm] | Wanted Signal mean power [dBm] | Interfering signal centre frequency minimum frequency offset from the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of Interfering Signal |
| 1-5, 7, 11, 13-14,18,19, 21, 24, 42, 43, 48, 65, 66, 70, 103 | (FUL\_low -20) | to | (FUL\_high +20) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 8, 26, 28 | (FUL\_low -20) | to | (FUL\_high +10) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +10) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 12 | (FUL\_low -20) | to | (FUL\_high +13) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +13) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 17 | (FUL\_low -20) | to | (FUL\_high +18) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +18) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 20, 71 | (FUL\_low -11) | to | (FUL\_high +20) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -11)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 25 | (FUL\_low -20) | to | (FUL\_high +15) | -35 | PREFSENS +6dB (Note 2) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +15) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 2) | ⎯ | CW carrier |
| 31, 72, 74, 87, 88 | (FUL\_low -20) | to | (FUL\_high +5) | -35 | PREFSENS +6dB (Note 2) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +5) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 2) | ⎯ | CW carrier |
| 85 | (FUL\_low -20) | to | (FUL\_high +12) | -35 | PREFSENS +6dB (Note 2) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +12) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 2) | ⎯ | CW carrier |
| Note 1: PREFSENS is specified in Table 7.2.1-5a.  Note 2: Up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size. | | | | | | | |

Table 7.6.1.1-3b: Blocking performance requirement for Home BS for NB-IoT standalone operation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Centre Frequency of Interfering Signal [MHz] | | | Interfering Signal mean power [dBm] | Wanted Signal mean power [dBm] | Interfering signal centre frequency minimum frequency offset from the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of Interfering Signal |
| 1-5, 7,11, 13-14,18,19, 21, 24, 42, 43, 48, 65, 66, 70, 103 | (FUL\_low -20) | to | (FUL\_high +20) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 8, 26, 28 | (FUL\_low -20) | to | (FUL\_high +10) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +10) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 12 | (FUL\_low -20) | to | (FUL\_high +13) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +13) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 17 | (FUL\_low -20) | to | (FUL\_high +18) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +18) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 20, 71 | (FUL\_low -11) | to | (FUL\_high +20) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -11)  12750 | -15 (Note 2) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 25 | (FUL\_low -20) | to | (FUL\_high +15) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +15) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 74 | (FUL\_low -20) | to | (FUL\_high +5) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +5) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 85 | (FUL\_low -20) | to | (FUL\_high +12) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +12) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| Note 1: PREFSENS is specified in Table 7.2.1-5b.  Note 2: Up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size. | | | | | | | |

Table 7.6.1.1-3c: Blocking performance requirement for Medium Range BS for NB-IoT standalone operation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Centre Frequency of Interfering Signal [MHz] | | | Interfering Signal mean power [dBm] | Wanted Signal mean power [dBm] | Interfering signal centre frequency minimum frequency offset from the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of Interfering Signal |
| 1-5, 7, 11, 13-14,18,19, 21, 24, 42, 43, 48, 65, 66, 70, 103 | (FUL\_low -20) | to | (FUL\_high +20) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 8, 26, 28 | (FUL\_low -20) | to | (FUL\_high +10) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +10) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 12 | (FUL\_low -20) | to | (FUL\_high +13) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +13) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 17 | (FUL\_low -20) | to | (FUL\_high +18) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +18) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 20, 71 | (FUL\_low -11) | to | (FUL\_high +20) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -11)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 25 | (FUL\_low -20) | to | (FUL\_high +15) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +15) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 31, 72, 74, 87, 88 | (FUL\_low -20) | to | (FUL\_high +5) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +5) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 85 | (FUL\_low -20) | to | (FUL\_high +12) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-4 | See table 7.6.1.1-4 |
| 1  (FUL\_high +12) | to  to | (FUL\_low -20)  12750 | -15 (Note 2) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| Note 1: PREFSENS is specified in Table 7.2.1-5c.  Note 2: Up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size. | | | | | | | |

NOTE: Tables 7.6.1.1-3, 7.6.1.1-3a, 7.6.1.1-3b and 7.6.1.1-3c assumes that two operating bands, where the downlink operating band (see Table 5.5-1) of one band would be within the in-band blocking region of the other band, are not deployed in the same geographical area.

Table 7.6.1.1-4: Interfering signals for blocking performance requirement for NB-IoT standalone operation

|  |  |  |
| --- | --- | --- |
| NB-IoT channel BW of the lowest/highest carrier received [MHz] | Interfering signal centre frequency minimum offset to the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of interfering signal |
| 0.2 | ±7.5 | 5MHz E-UTRA signal |

For E-UTRA with NB-IoT in-band/guard band operation, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel, with a wanted and an interfering signal coupled to BS antenna input using the parameters in Tables 7.6.1.1-5, 7.6.1.1-5a, 7.6.1.1-5b, 7.6.1.1-5c and 7.6.1.1-6. The reference measurement channel for the wanted signal is identified in Table 7.2.1-1, 7.2.1-2, 7.2.1-3 and 7.2.1-4 for each channel bandwidth for E-UTRA, Table 7.2.1-5, 7.2.1-5a, 7.2.1-5b and 7.2.1-5c for NB-IoT and further specified in Annex A.

The blocking requirement is applicable outside the Base Station RF Bandwidth or Radio Bandwidth. The interfering signal offset is defined relative to the Base Station RF Bandwidth edges or Radio Bandwidth edges.

Table 7.6.1.1-5: Blocking performance requirement for Wide Area BS for E-UTRA with NB-IoT in-band/guard band operation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Centre Frequency of Interfering Signal [MHz] | | | Interfering Signal mean power [dBm] | Wanted Signal mean power [dBm] | Interfering signal centre frequency minimum frequency offset from the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of Interfering Signal |
| 1-5, 7,11, 13-14,18,19, 21, 24, 42, 43, 48, 65, 66, 70 | (FUL\_low -20) | to | (FUL\_high +20) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 8, 26, 28 | (FUL\_low -20) | to | (FUL\_high +10) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +10) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 12 | (FUL\_low -20) | to | (FUL\_high +13) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +13) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 17 | (FUL\_low -20) | to | (FUL\_high +18) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +18) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 20, 71 | (FUL\_low -11) | to | (FUL\_high +20) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -11)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 25 | (FUL\_low -20) | to | (FUL\_high +15) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +15) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 31, 72, 73, 74, 87, 88 | (FUL\_low -20) | to | (FUL\_high +5) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +5) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 85 | (FUL\_low -20) | to | (FUL\_high +12) | -43 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +12) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| Note 1: PREFSENS depends on the channel bandwidth as specified in Table 7.2.1-1 for E-UTRA and is specified in Table 7.2.1-5 for NB-IoT.  Note 2: For a BS capable of multiband operation, in case of interfering signal that is not in the in-band blocking frequency range of the operating band where the wanted signal is present, and not in the in-band blocking frequency range of an adjacent or overlapping operating band, the wanted signal mean power is equal to PREFSENS + 1.4 dB.  Note 3: For NB-IoT, up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size. | | | | | | | |

Table 7.6.1.1-5a: Blocking performance requirement for Local Area BS for E-UTRA with NB-IoT in-band/guard band operation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Centre Frequency of Interfering Signal [MHz] | | | Interfering Signal mean power [dBm] | Wanted Signal mean power [dBm] | Interfering signal centre frequency minimum frequency offset from the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of Interfering Signal |
| 1-5, 7, 11, 13-14,18,19, 21, 24, 42, 43, 48, 65, 66, 70 | (FUL\_low -20) | to | (FUL\_high +20) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 8, 26, 28 | (FUL\_low -20) | to | (FUL\_high +10) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +10) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 12 | (FUL\_low -20) | to | (FUL\_high +13) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +13) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 17 | (FUL\_low -20) | to | (FUL\_high +18) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +18) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 20, 71 | (FUL\_low -11) | to | (FUL\_high +20) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -11)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 25 | (FUL\_low -20) | to | (FUL\_high +15) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +15) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 31, 72, 74, 87, 88 | (FUL\_low -20) | to | (FUL\_high +5) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +5) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 85 | (FUL\_low -20) | to | (FUL\_high +12) | -35 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +12) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| Note 1: PREFSENS depends on the channel bandwidth as specified in Table 7.2.1-1 for E-UTRA and is specified in Table 7.2.1-5a for NB-IoT.  Note 2: For a BS capable of multiband operation, in case of interfering signal that is not in the in-band blocking frequency range of the operating band where the wanted signal is present, and not in the in-band blocking frequency range of an adjacent or overlapping operating band, the wanted signal mean power is equal to PREFSENS + 1.4 dB.  Note 3: For NB-IoT, up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size. | | | | | | | |

Table 7.6.1.1-5b: Blocking performance requirement for Home BS for E-UTRA with NB-IoT in-band/guard band operation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Centre Frequency of Interfering Signal [MHz] | | | Interfering Signal mean power [dBm] | Wanted Signal mean power [dBm] | Interfering signal centre frequency minimum frequency offset from the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of Interfering Signal |
| 1-5, 7, 11, 13-14,18,19, 21, 24, 42, 43, 48, 65, 66, 70 | (FUL\_low -20) | to | (FUL\_high +20) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 8, 26, 28 | (FUL\_low -20) | to | (FUL\_high +10) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +10) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 12 | (FUL\_low -20) | to | (FUL\_high +13) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +13) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 17 | (FUL\_low -20) | to | (FUL\_high +18) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +18) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 20, 71 | (FUL\_low -11) | to | (FUL\_high +20) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -11)  12750 | -15 (Note 3) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 25 | (FUL\_low -20) | to | (FUL\_high +15) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +15) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 74 | (FUL\_low -20) | to | (FUL\_high +5) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +5) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| 85 | (FUL\_low -20) | to | (FUL\_high +12) | -27 | PREFSENS +14dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +12) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +14dB (Note 1) | ⎯ | CW carrier |
| Note 1: PREFSENS depends on the channel bandwidth as specified in Table 7.2.1-1 for E-UTRA and is specified in Table 7.2.1-5b for NB-IoT.  Note 2: (Void)  Note 3: For NB-IoT, up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size. | | | | | | | |

Table 7.6.1.1-5c: Blocking performance requirement for Medium Range BS for E-UTRA with NB-IoT in-band/guard band operation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | Centre Frequency of Interfering Signal [MHz] | | | Interfering Signal mean power [dBm] | Wanted Signal mean power [dBm] | Interfering signal centre frequency minimum frequency offset from the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of Interfering Signal |
| 1-5, 7, 11, 13-14,18,19, 21, 24, 42, 43, 48, 65, 66, 70 | (FUL\_low -20) | to | (FUL\_high +20) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 8, 26, 28 | (FUL\_low -20) | to | (FUL\_high +10) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +10) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 12 | (FUL\_low -20) | to | (FUL\_high +13) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +13) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 17 | (FUL\_low -20) | to | (FUL\_high +18) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +18) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 20, 71 | (FUL\_low -11) | to | (FUL\_high +20) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +20) | to  to | (FUL\_low -11)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 25 | (FUL\_low -20) | to | (FUL\_high +15) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +15) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 31, 72, 74, 87, 88 | (FUL\_low -20) | to | (FUL\_high +5) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +5) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| 85 | (FUL\_low -20) | to | (FUL\_high +12) | -38 | PREFSENS +6dB (Note 1) | See table 7.6.1.1-6 | See table 7.6.1.1-6 |
| 1  (FUL\_high +12) | to  to | (FUL\_low -20)  12750 | -15 (Note 3) | PREFSENS +6dB (Note 1) | ⎯ | CW carrier |
| Note 1: PREFSENS depends on the channel bandwidth as specified in Table 7.2.1-1 for E-UTRA and is specified in Table 7.2.1-5c for NB-IoT.  Note 2: For a BS capable of multiband operation, in case of interfering signal that is not in the in-band blocking frequency range of the operating band where the wanted signal is present, and not in the in-band blocking frequency range of an adjacent or overlapping operating band, the wanted signal mean power is equal to PREFSENS + 1.4 dB.  Note 3: For NB-IoT, up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size.. | | | | | | | |

NOTE: Tables 7.6.1.1-5, 7.6.1.1-5a and 7.6.1.1-5b assume that two operating bands, where the downlink operating band (see Table 5.5-1) of one band would be within the in-band blocking region of the other band, are not deployed in the same geographical area.

Table 7.6.1.1-6: Interfering signals for blocking performance requirement for E-UTRA with NB-IoT in-band/guard band operation

|  |  |  |
| --- | --- | --- |
| E-UTRA  channel BW of the lowest/highest carrier received [MHz] | Interfering signal centre frequency minimum offset to the lower/upper Base Station RF Bandwidth edge or sub-block edge inside a sub-block gap [MHz] | Type of interfering signal |
| 3(Note) | ±4.5 | 3MHz E-UTRA signal |
| 5 | ±7.5 | 5MHz E-UTRA signal |
| 10 | ±7.5 | 5MHz E-UTRA signal |
| 15 | ±7.5 | 5MHz E-UTRA signal |
| 20 | ±7.5 | 5MHz E-UTRA signal |
| Note: 3 MHz channel bandwidth is not applicable to guard band operation. | | |

## < end of changes >