**3GPP TSG-RAN WG4 Meeting #98-e *R4-2103885***

**Electronic Meeting, 25 January – 5 February, 2020**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **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:*** | CR to 37.105 on OBUE table headings and applicability | | | | | | | | | |
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| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The OBUE applicability tables headings are ambiguous, and sometimes not complete or fully aligned with the intended applicability:   * Reference to BC is not consistent and, in some cases, incorrect * Language is unclear, especially the use of “except for” and or/nor. * The order of references to BC, frequency ranges, supported RATs etc. is inconsistent between headings, causing confusion and ambiguity | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The CR corrects the headings to align with the intended applicability, see also the guidance on Lists in TR 21.801. The revised headings are all written with the same structure: “<BS class> BS operating band unwanted emission mask (UEM) in <BC> bands <f. range> applicable for: <BS type 1>; <BS type 2>…; or <BS type x>…”  Where  <BS class> = “Wide Area”, “Medium range” or “Local Area”  <BC> = BC1, BC2, BC3 or combination thereof  <f range> = Limitation to frequency range for bands, e.g. “below 1 GHz”  <BS type> = A set of conditions on supported RAT(s), specific bands, etc., always starting with “BS…”, separated by “,” and an “and” for the final condition. Condition on max power is always first. If there are multiple types, they are separated by “;”  Examples: “**Wide Area** BS operating band unwanted emission mask (UEM) in **BC1 and BC3 bands** applicable for: BS **not supporting NR**; BS **operating NR in Band 1, 7 and/or 38 in Europe**; or BS **with standalone NB-IoT at the BS RF bandwidth edge (irrespective of NR support)**”  “**Medium Range** BS operating band unwanted emission mask (UEM) in **BC1 and BC3 bands** applicable for: BS **with maximum output power 31 < PRated,c ≤ 38 dBm**, **supporting NR** and **not supporting UTRA**”  Change marks are made over the complete heading text for each table, in order to make the full change visible and to ease the CR implementation by MCC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | OBUE table headings would remain ambiguous and, in some cases, incomplete or incorrect. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.6.5.2.2, 6.6.5.2.3, 9.7.5.2.2, 9.7.5.2.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | | **X** |  | Test specifications | | | | 37.145-1, 37.145-2 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev1: The applicability for BC3 has been corrected to align with the original text in some headings. “Or” is added to the penultimate applicable “BS type” as recommended in TR 21.801. | | | | | | | | |

#### 6.6.5.2 Minimum requirement for MSR operation

##### 6.6.5.2.1 General

The MSR operating band unwanted emission *basic limit*s are the same as those specified in 3GPP TS 37.104 [9], subclauses 6.6.2.1, 6.6.2.2 and 6.6.2.4.

The operating band unwanted emission requirements for an MSR AAS BS are that for each *TAB connector TX min cell group* and each applicable *basic limit* as specified in 3GPP TS 37.104 [5], the power summation of the emissions at the *TAB connectors* of the *TAB connector TX min cell group* shall not exceed an AAS BS limit specified as the *basic limit* + 10log10(NTXU,countedpercell).

NOTE: Conformance to the AAS BS operating band unwanted emission requirement can be demonstrated by meeting at least one of the following criteria as determined by the manufacturer:

1) The sum of the emissions power measured on each *TAB connector* in the *TAB connector TX min cell group* shall be less than or equal to the AAS BS limit as defined in this subclause for the respective frequency span.

Or

2) The unwanted emissions power at each *TAB connector* shall be less than or equal to the AAS BS limit as defined in this subclause for the respective frequency span, scaled by -10log10(*n*), where *n* is the number of *TAB connector* in the *TAB connector TX min cell group*.

##### 6.6.5.2.2 *Basic limits* for Band Categories 1 and 3

For a *TAB connector* operating in Band Category 1 or Band Category 3 the requirement applies outside the *Base Station RF Bandwidth edges*. In addition, for an AAS BS of Wide Area BS class operating in *non-contiguous spectrum*, it applies inside any *sub-block gap*. In addition, for an AAS BS of Wide Area BS class operating in multiple bands, the requirements apply inside any *Inter RF Bandwidth gap*.

For an AAS BS of Medium Range BS class operating in Band Category 1 the requirement applies outside the *Base Station RF Bandwidth edges*. In addition, for an AAS BS of Medium Range BS class operating in *non-contiguous spectrum*, it applies inside any *sub-block gap*. In addition, for an AAS BS of Medium Range BS class operating in multiple bands, the requirements apply inside any *Inter RF Bandwidth gap*.

For an AAS BS of Local Area BS class operating in Band Category 1 the requirement applies outside the *Base Station RF Bandwidth edges*. In addition, for an AAS BS of Local Area BS class operating in *non-contiguous spectrum*, it applies inside any *sub-block gap*. In addition, for an AAS BS Local Area BS class operating in multiple bands, the requirements apply inside any *Inter RF Bandwidth gap*.

Outside the *Base Station RF Bandwidth edges*, *basic limits* are specified in tables 6.6.5.2.2-1 to 6.6.5.2.2-4 below, where:

- Δf is the separation between *the Base Station RF Bandwidth edge* frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency.

- f\_offset is the separation between the *Base Station RF Bandwidth edge* frequency and the centre of the measuring filter.

- f\_offsetmax is the offset to the frequency ΔfOBUE outside the *downlink operating band*.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

Applicability of Wide Area operating band unwanted emission requirements in tables 6.6.5.2.2-1, 6.6.5.2.2-1a and 6.6.5.2.2-1b is specified in table 6.6.2.1-0.

Table 6.6.5.2.2-0: Applicability of operating band unwanted emission requirements for BC1 and BC3 Wide Area BS

|  |  |  |
| --- | --- | --- |
| NR band operation | UTRA supported (NOTE 1) | Applicable requirement table |
| None | Y/N | 6.6.5.2.2-1 |
| In certain regions (NOTE 2), band 1 | N | 6.6.5.2.2-1 |
| Any below 1 GHz | N | 6.6.5.2.2-1a |
| Any above 1 GHz except for certain regions (NOTE 2), band 1 | N | 6.6.2.1-1b |
| NOTE 1: NR operation with UTRA is not supported in this version of specification.  NOTE 2: Applicable only for operation in regions where Category B limits as defined in ITU-R Recommendation SM.329 [14] are used for which category B option 2 operating band unwanted emissions requirements as defined in TS 36.104 [8] and TS 38.104 [27] are applied. | | |

For a *multi-band TAB connector*, inside any *Inter RF Bandwidth gaps* with Wgap < 2×ΔfOBUE MHz, a combined *basic* limit shall be applied which is the cumulative sum of emissions shall not exceed the cumulative sum of the *basic limits* specified at the *Base Station RF Bandwidth edges* on each side of the *Inter-RF Bandwidth gap*. The *basic limit* for *Base Station RF Bandwidth edge* is specified in table 6.6.5.2.2-1 to 6.6.5.2.2-4 below, where in this case:

- Δf is the separation between the *Base Station RF Bandwidth edge* frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency.

- f\_offset is the separation between the *Base Station RF Bandwidth edge* frequency and the centre of the measuring filter.

- f\_offsetmax is equal to the inter *Base Station RF Bandwidth* gap minus half of the bandwidth of the measuring filter.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

For a *multi-band TAB connector*, the operating band unwanted emission *basic limits* apply also in a supported operating band without any carriers transmitted, in the case where there are carriers transmitted in other operating band(s). In this case where there is no carrier transmitted in an operating band, the operating band unwanted emission limit, as defined in the tables of the present subclause for the largest frequency offset (Δfmax), of a band where there is no carrier transmitted shall apply from 10 MHz below the lowest frequency, up to 10 MHz above the highest frequency of the supported downlink operating band without any carrier transmitted. And no cumulative *basic limits* are applied in the *inter-band gap* between a supported downlink band with carrier(s) transmitted and a supported downlink band without any carrier transmitted.

Inside any *sub-block gap* for a *TAB connector* operating in *non-contiguous spectrum*, a combined *basic* limit shall be applied which is the cumulative sum of the *basic limits* specified for the adjacent sub blocks on each side of the *sub-block gap*. The *basic limit* for each sub block is specified in tables 6.6.5.2.2-1 to 6.6.5.2.2-4 below, where in this case:

- Δf is the separation between the sub block edge frequency and the nominal -3 dB point of the measuring filter closest to the sub block edge.

- f\_offset is the separation between the sub block edge frequency and the centre of the measuring filter.

- f\_offsetmax is equal to the *sub-block gap* bandwidth minus half of the bandwidth of the measuring filter.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

Table 6.6.5.2.2-1: Wide Area BS operating band unwanted emission mask (UEM) in BC1 and BC3 bands applicable for: BS not supporting NR; or BS supporting NR in Band n1

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 1, 2) | Measurement bandwidth (NOTE 4) |
| 0 MHz ≤ Δf < 0.2 MHz | 0.015MHz ≤ f\_offset < 0.215MHz | -14 dBm | 30 kHz |
| 0.2 MHz ≤ Δf < 1 MHz | 0.215MHz ≤ f\_offset < 1.015MHz | (Note 6) | 30 kHz |
| (NOTE 3) | 1.015MHz ≤ f\_offset < 1.5 MHz | -26 dBm (Note 6) | 30 kHz |
| 1 MHz ≤ Δf ≤  min(Δfmax, 10 MHz) | 1.5 MHz ≤ f\_offset < min(f\_offsetmax, 10.5 MHz) | -13 dBm (Note 6) | 1 MHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -15 dBm (Note 5, 6) | 1 MHz |
| NOTE 1: For MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *basic limit* within *sub-block gaps* shall be -15dBm/MHz (for MSR *multi-band TAB connector*, either this limit or -16dBm/100kHz with correspondingly adjusted f\_offset shall apply for this frequency offset range for operating bands < 1 GHz).  NOTE 2: For MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.  NOTE 6: For MSR *multi-band TAB connector*, either this limit or -16dBm/100kHz with correspondingly adjusted f\_offset shall apply for this frequency offset range for operating bands < 1 GHz. | | | |

Table 6.6.5.2.2-1a: Wide Area BS operating band unwanted emission mask (UEM) in BC1 and BC3 bands ≤ 1 GHz applicable for: BS supporting NR and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (Note 1, 2) | Measurement bandwidth (Note 4) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -14 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -16 dBm (Note 5) | 100 kHz |
| NOTE 1: For MSR *TAB connector* supporting non-contiguous spectrum operation within any operating band, the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth*. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the *basic limit* within sub-block gaps shall be -16dBm/100kHz.  NOTE 2: For MSR *multi band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUEthe *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or Base station *RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth*. | | | |

Table 6.6.5.2.2-1b: Wide Area BS operating band unwanted emission mask (UEM) in BC1 and BC3 bands > 1 GHz applicable for: BS supporting NR, not operating NR in band n1, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (Note 1, 2) | Measurement bandwidth (Note 4) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -14 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -15 dBm (Note 5) | 1MHz |
| NOTE 1: For MSR *TAB connector* supporting non-contiguous spectrum operation within any operating band, the *basic limit* within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *basic limit* within sub-block gaps shall be -15dBm/1MHz.  NOTE 2: For MSR *multi band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUEthe *basic limit* within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth.* | | | |

Table 6.6.5.2.2-2: Medium Range BS operating band unwanted emission mask (UEM) in BC1 bands applicable for: BS with maximum output power 31 < Prated,c,cell-10\*log10(NTXU,countedpercell) ≤ 38 dBm and not supporting NR

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 1, 2) | Measurement bandwidth (NOTE 4) |
| 0 MHz ≤ Δf < 0.6 MHz | 0.015MHz ≤ f\_offset < 0.615MHz |  | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz |  | 30 kHz |
| (NOTE 3) | 1.015MHz ≤ f\_offset < 1.5 MHz | Prated,c,cell – 10\*log10(NTXU,countedpercell) – 65 dB | 30 kHz |
| 1 MHz ≤ Δf ≤ 2.6 MHz | 1.5 MHz ≤ f\_offset < 3.1 MHz | Prated,c,cell – 10\*log10(NTXU,countedpercell) – 52 dB | 1 MHz |
| 2.6 MHz ≤ Δf ≤ 5 MHz | 3.1 MHz ≤ f\_offset < 5.5 MHz | min(Prated,c,cell – 10\*log10(NTXU,countedpercell) – 52 dB, -15dBm) | 1 MHz |
| 5 MHz ≤ Δf ≤ Δfmax | 5.5 MHz ≤ f\_offset < f\_offsetmax | Prated,c,cell – 10\*log10(NTXU,countedpercell) – 56 dB | 1 MHz |
| NOTE 1: For MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *basic limit* within *sub-block gaps* shall be (Prated,c,cell-10\*log10(NTXU,countedpercell) - 56 dB) /MHz.  NOTE 2: For MSR multi-band *TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*. | | | |

Table 6.6.5.2.2-2a: Medium Range BS operating band unwanted emission mask (UEM) in BC1 bands applicable for: BS with maximum output power 31 < Prated,c,cell-10\*log10(NTXU,countedpercell) ≤ 38 dBm, supporting NR, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (Note 1, 2) | Measurement bandwidth (Note 4) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | Prated,c,cell – 10\*log10(NTXU,countedpercell) – 53 dB - (7/5)\*(f\_offset/MHz-0,05) dB | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | Prated,c,cell – 10\*log10(NTXU,countedpercell) - 60 dB | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | Min(Prated,c,cell – 10\*log10(NTXU,countedpercell) - 60 dB, - 25 dBm)  (Note 5) | 100 kHz |
| NOTE 1: For MSR *TAB connector* supporting non-contiguous spectrum operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *basic limit* within sub-block gaps shall be Min(Prated,c,cell – 10\*log10(NTXU,countedpercell) – 60 dB, -25 dBm) / 100 kHz.  NOTE 2: For MSR *multi band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUEthe *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. | | | |

Table 6.6.5.2.2-3: Medium Range BS operating band unwanted emission mask (UEM) in BC1 bands applicable for: BS with maximum output power Prated,c,cell-10\*log10(NTXU,countedpercell) ≤ 31 dBm and not supporting NR

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 1, 2) | Measurement bandwidth (NOTE 4) |
| 0 MHz ≤ Δf < 0.6 MHz | 0.015MHz ≤ f\_offset < 0.615MHz |  | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz |  | 30 kHz |
| (NOTE 3) | 1.015MHz ≤ f\_offset < 1.5 MHz | -34 dBm | 30 kHz |
| 1 MHz ≤ Δf ≤ 5 MHz | 1.5 MHz ≤ f\_offset < 5.5 MHz | -21 dBm | 1 MHz |
| 5 MHz ≤ Δf ≤ Δfmax | 5.5 MHz ≤ f\_offset < f\_offsetmax | -25 dBm | 1 MHz |
| NOTE 1: For MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *basic limit* within *sub-block gaps* shall be -25 dBm/MHz.  NOTE 2: For MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*. | | | |

Table 6.6.5.2.2-3a: Medium Range BS operating band unwanted emission mask (UEM) in BC1 bands applicable for: BS with maximum output power Prated,c,cell-10\*log10(NTXU,countedpercell) ≤ 31 dBm, supporting NR, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limit* (Note 1, 2) | Measurement bandwidth (Note 4) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -29 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -29 dBm (Note 5) | 100 kHz |
| NOTE 1: For MSR *TAB connector* supporting non-contiguous spectrum operation within any operating band the *basic limit*  within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *basic limit* within sub-block gaps shall be -29dBm/100kHz.  NOTE 2: For MSR *multi band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUEthe *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of the *Inter RF Bandwidth* gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. | | | |

Table 6.6.5.2.2-4: Local Area BS operating band unwanted emission mask (UEM) in BC1 bands

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (Note 1, 2) | Measurement bandwidth (NOTE 4) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -37 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -37 dBm (NOTE 5) | 100 kHz |
| NOTE 1: For MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *basic limit* within *sub-block gaps* shall be -37dBm/100 kHz.  NOTE 2: For MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*. | | | |

NOTE 3: This frequency range ensures that the range of values of f\_offset is continuous.

NOTE 4: As a general rule for the requirements in the present subclause, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

NOTE 5: The requirement is not applicable when Δfmax < 10 MHz.

##### 6.6.5.2.3 *Basic limit* for Band Category 2

For a *TAB connector* operating in Band Category 2 the requirement applies outside the *Base Station RF Bandwidth edges*. In addition, for a *TAB connector* operating in *non-contiguous spectrum*, it applies inside any *sub-block gap*.

Outside the *Base Station RF Bandwidth edges*, *basic limits* are specified in tables 6.6.5.2.3-1 to 6.6.5.2.3-8 below, where:

- Δf is the separation between the *Base Station RF Bandwidth edge* frequency and the nominal -3dB point of the measuring filter closest to the carrier frequency.

- f\_offset is the separation between the *Base Station RF Bandwidth edge* frequency and the centre of the measuring filter.

- f\_offsetmax is the offset to the frequency ΔfOBUE outside the *downlink operating band*.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

For a *multi-band TAB connector*, inside any *Inter-RF Bandwidth gaps* with Wgap < 2×ΔfOBUE MHz, a combined *basic* limit shall be applied which is the cumulative sum of the *basic limit*s specified at the *Base Station RF Bandwidth edges* on each side of the *Inter-RF Bandwidth gap*. The *basic limit* for *Base Station RF Bandwidth edge* is specified in table 6.6.5.2.3-1 to 6.6.5.2.3-8 below, where in this case:

- Δf is the separation between the *Base Station RF Bandwidth edge* frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency.

- f\_offset is the separation between the *Base Station RF Bandwidth edge* frequency and the centre of the measuring filter.

- f\_offsetmax is equal to the *Inter RF Bandwidth gap* minus half of the bandwidth of the measuring filter.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

For a *multi-band TAB connector* where multiple bands are mapped on the same antenna connector and where there is no carrier transmitted in an operating band, the operating band unwanted emission limit, as defined in the tables of the present subclause for the largest frequency offset (Δfmax), of a band where there is no carrier transmitted shall apply from 10 MHz below the lowest frequency, up to 10 MHz above the highest frequency of the supported downlink operating band without any carrier transmitted. And no cumulative *basic limits* are applied in the *inter-band gap* between a supported downlink band with carrier(s) transmitted and a supported downlink band without any carrier transmitted.

Inside any *sub-block gap* for a *TAB connector* operating in *non-contiguous spectrum*, a combined *basic* limit shall be applied which is the cumulative sum of the *basic limit* specified for the adjacent sub blocks on each side of the *sub-block gap*. The *basic limit* for each sub block is specified in tables 6.6.5.2.3-1 to 6.6.5.2.3-8 below, where in this case:

- Δf is the separation between the sub block edge frequency and the nominal -3 dB point of the measuring filter closest to the sub block edge.

- f\_offset is the separation between the sub block edge frequency and the centre of the measuring filter.

- f\_offsetmax is equal to the *sub-block gap* bandwidth minus half of the bandwidth of the measuring filter.

- Δfmax is equal to f\_offsetmax minus half of the bandwidth of the measuring filter.

Applicability of Wide Area operating band unwanted emission requirements in Tables 6.6.5.2.31, 6.6.5.2.3-1a and 6.6.5.2.3-1b is specified in table 6.6.5.2.3-0.

Table 6.6.5.2.3-0: Applicability of operating band unwanted emission requirements for BC2 Wide Area BS

|  |  |  |
| --- | --- | --- |
| NR band operation | UTRA supported (NOTE 1) | Applicable requirement table |
| None | Y/N | 6.6.5.2.3-1 |
| In certain regions (NOTE 2), bands 3, 8 | N | 6.6.5.2.3-1 |
| Any below 1 GHz except for certain regions (NOTE 2), band 8 | N | 6.6.5.2.3-1a |
| Any above 1 GHz except for certain regions (NOTE 2), band 3 | N | 6.6.5.2.3-1b |
| NOTE 1: NR operation with UTRA is not supported in this version of specification.  NOTE 2: Applicable only for operation in regions where Category B limits as defined in ITU-R Recommendation SM.329 [14] are used for which category B option 2 operating band unwanted emissions requirements as defined in TS 36.104 [8] and TS 38.104 [27] are applied. | | |

Table 6.6.5.2.3-1: Wide Area BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS not supporting NR; or BS supporting NR in Band n3 or n8

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 2, 3) | Measurement bandwidth (NOTE 10) |
| 0 MHz ≤ Δf < 0.2 MHz  (NOTE 1) | 0.015 MHz ≤ f\_offset < 0.215 MHz | -14 dBm | 30 kHz |
| 0.2 MHz ≤ Δf < 1 MHz | 0.215 MHz ≤ f\_offset < 1.015 MHz | (Note 13) | 30 kHz |
| (NOTE 9) | 1.015 MHz ≤ f\_offset < 1.5 MHz | -26 dBm (Note 13) | 30 kHz |
| 1 MHz ≤ Δf ≤  min(Δfmax, 10 MHz) | 1.5 MHz ≤ f\_offset < min(f\_offsetmax, 10.5 MHz) | -13 dBm (Note 13) | 1 MHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -15 dBm (Note 11, 13) | 1 MHz |
| NOTE 1: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 6.6.5.2.3-2 apply for 0 MHz ≤ Δf < 0.15 MHz.  NOTE 2: For MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *basic limit* within *sub-block gaps* shall be -15dBm/MHz (for MSR *multi-band TAB connector*, either this limit or -16dBm/100kHz with correspondingly adjusted f\_offset shall apply for this frequency offset range for operating bands < 1 GHz).  NOTE 3: For a MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE operation the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*.  NOTE 13: For MSR *multi-band TAB connector*, either this limit or -16dBm/100kHz with correspondingly adjusted f\_offset shall apply for this frequency offset range for operating bands < 1 GHz. | | | |

Table 6.6.5.2.3-1a: Wide Area BS operating band unwanted emission mask (UEM) in BC2 bands ≤ 1 GHz applicable for: BS supporting NR, not operating NRin band n8, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limit* (Note 1, 2) | Measurement bandwidth (Note 10) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -14 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -16 dBm (Note 11) | 100 kHz |
| NOTE 1: For MSR *TAB connector* supporting non-contiguous spectrum operation within any operating band, the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block or *RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth*. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *basic limit* within sub-block gaps shall be -16dBm/100kHz.  NOTE 2: For MSR *multi band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUEthe *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth.*  NOTE 3: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 6.6.5.2.3-2 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 6.6.5.2.3-1b: Wide Area BS operating band unwanted emission mask (UEM) in BC2 bands > 1 GHz applicable for: BS supporting NR, not operating NR in band n3, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limit* (Note 1, 2) | Measurement bandwidth (Note 10) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -14 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -15 dBm (Note 11) | 1MHz |
| NOTE 1: For MSR *TAB connectors* supporting non-contiguous spectrum operation within any operating band, the *basic limit*  within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *basic limit* within sub-block gaps shall be -15dBm/1MHz.  NOTE 2: For MSR *multi band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUEthe *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth.*  NOTE 3: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 6.6.5.2.3-2 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 6.6.5.2.3-2: Wide Area BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS operating with E-UTRA 1.4 or 3 MHz carriers adjacent to the *Base Station RF Bandwidth edge*

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 5, 6) | Measurement bandwidth (NOTE 10) |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.15 MHz | 0.065 MHz ≤ f\_offset < 0.165 MHz |  | 30 kHz |
| NOTE 4: The limits in this table only apply for operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge.*  NOTE 5: For MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*.  NOTE 6: For a MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*. | | | |

Table 6.6.5.2.3-3: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power 31 < Prated,c,cell-10\*log10(NTXU,countedpercell) ≤ 38 dBm and not supporting NR

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 2, 3) | Measurement bandwidth (NOTE 10) |
| 0 MHz ≤ Δf < 0.6 MHz  (NOTE 1) | 0.015MHz ≤ f\_offset < 0.615MHz | Prated,c,cell – 10\*log10(NTXU,countedpercell) - 58 dB-(5/3)\*(f\_offset/MHz-0,015)dB | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz | Prated,c,cell – 10\*log10(NTXU,countedpercell) – 53 dB -15\*(f\_offset/MHz-0,215) dB | 30 kHz |
| (NOTE 9) | 1.015MHz ≤ f\_offset < 1.5 MHz | Prated,c,cell – 10\*log10(NTXU,countedpercell) - 65 dB | 30 kHz |
| 1 MHz ≤ Δf ≤ 2.8 MHz | 1.5 MHz ≤ f\_offset < 3.3 MHz | Prated,c,cell – 10\*log10(NTXU,countedpercell) - 52 dB | 1 MHz |
| 2.8 MHz ≤ Δf ≤ 5 MHz | 3.3 MHz ≤ f\_offset < 5.5 MHz | min(Prated,c,cell – 10\*log10(NTXU,countedpercell) - 52 dB, -15dBm) | 1 MHz |
| 5 MHz ≤ Δf ≤ Δfmax | 5.5 MHz ≤ f\_offset < f\_offsetmax | Prated,c,cell – 10\*log10(NTXU,countedpercell) - 56 dB | 1 MHz |
| NOTE 1: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 6.6.5.2.3-5 apply for 0 MHz ≤ Δf < 0.15 MHz.  NOTE 2: For a MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *basic limit* within *sub-block gaps* shall be (Prated,c,cell-10\*log10(NTXU,countedpercell) - 56 dB)/MHz.  NOTE 3: For a MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of *the Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*. | | | |

Table 6.6.5.2.3-3a: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power 31 < Prated,c,cell-10\*log10(NTXU,countedpercell) ≤ 38 dBm, supporting NR, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limit* (Note 1, 2) | Measurement bandwidth (Note 10) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | Prated,c,cell – 10\*log10(NTXU,countedpercell)-53 dB - (7/5)\*(f\_offset/MHz - 0,05) dB | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | Prated,c,cell – 10\*log10(NTXU,countedpercell) - 60 dB | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | Min(Prated,c,cell – 10\*log10(NTXU,countedpercell) - 60 dB, -25 dBm)  (Note 11) | 100 kHz |
| NOTE 1: For MSR *TAB connectors* supporting non-contiguous spectrum operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *basic limit* within sub-block gaps shall be Min(Prated,c,cell – 10\*log10(NTXU,countedpercell) -60 dB, -25 dBm) / 100 kHz.  NOTE 2: For MSR *multi band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of *the Inter RF Bandwidth gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block.  NOTE 3: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 6.6.5.2.3-5 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 6.6.5.2.3-4: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power Prated,c,cell-10\*log10(NTXU,countedpercell ≤ 31 dBm and not supporting NR

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 2, 3) | Measurement bandwidth (NOTE 10) |
| 0 MHz ≤ Δf < 0.6 MHz  (NOTE 1) | 0.015MHz ≤ f\_offset < 0.615MHz |  | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz |  | 30 kHz |
| (NOTE 9) | 1.015MHz ≤ f\_offset < 1.5 MHz | -34 dBm | 30 kHz |
| 1 MHz ≤ Δf ≤ 5 MHz | 1.5 MHz ≤ f\_offset < 5.5 MHz | -21 dBm | 1 MHz |
| 5 MHz ≤ Δf ≤ Δfmax | 5.5 MHz ≤ f\_offset < f\_offsetmax | -25 dBm | 1 MHz |
| NOTE 1: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 6.6.5.2.3-6 apply for 0 MHz ≤ Δf < 0.15MHz.  NOTE 2: For a MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *basic limit* within *sub-block gaps* shall be -25dBm/MHz.  NOTE 3: For a MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*. | | | |

Table 6.6.5.2.3-4a: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power Prated,c,cell-10\*log10(NTXU,countedpercell) ≤ 31 dBm, supporting NR, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic limit* (Note 1, 2) | Measurement bandwidth (Note 10) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -29 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -29 dBm (Note 11) | 100 kHz |
| NOTE 1: For MSR *TAB connectors* supporting non-contiguous spectrum operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *basic limit* within sub-block gaps shall be -29dBm/100kHz.  NOTE 2: For MSR *multi band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUEthe *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block.  NOTE 3: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 6.6.5.2.3-5 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 6.6.5.2.3-5: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power 31 < Prated,c,cell-10\*log10(NTXU,countedpercell) ≤ 38 dBm and operating E-UTRA 1.4 or 3 MHz carriers adjacent to the *Base Station RF Bandwidth edge*

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 5, 6) | Measurement bandwidth (NOTE 10) |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz | Prated,c,cell-10\*log10(NTXU,countedpercell)-38dB-60\*(f\_offset/MHz-0,015)dB | 30 kHz |
| 0.05 MHz ≤ Δf < 0.15 MHz | 0.065 MHz ≤ f\_offset < 0.165 MHz | Prated,c,cell-10\*log10(NTXU,countedpercell)-41dB-160\*(f\_offset/MHz-0,065)dB | 30 kHz |
| NOTE 4: The limits in this table only apply for operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*.  NOTE 5: For a MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*.  NOTE 6: For a MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*. | | | |

Table 6.6.5.2.3-6: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power Prated,c,cell-10\*log10(NTXU,countedpercell) ≤ 31 dBm and operating E-UTRA 1.4 or 3 MHz carriers adjacent to the *Base Station RF Bandwidth edge*,

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 5, 6) | Measurement bandwidth (NOTE 10) |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.15 MHz | 0.065 MHz ≤ f\_offset < 0.165 MHz |  | 30 kHz |
| NOTE 4: The limits in this table only apply for operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*.  NOTE 5: For a MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*.  NOTE 6: For a MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*. | | | |

Table 6.6.5.2.3-7: Local Area BS operating band unwanted emission mask (UEM) in BC2 bands

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 2, 3) | Measurement bandwidth (NOTE 10) |
| 0 MHz ≤ Δf < 5 MHz  (NOTE 1) | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -37 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -37 dBm (NOTE 11) | 100 kHz |
| NOTE 1: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 6.6.5.2.3-8 apply for 0 MHz ≤ Δf < 0.16 MHz.  NOTE 2: For a MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *basic limit* within *sub-block gaps* shall be -37dBm/100 kHz.  NOTE 3: For a MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*. | | | |

Table 6.6.5.2.3-8: Local Area BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS operating with E-UTRA 1.4 or 3 MHz carriers adjacent to the *Base Station RF Bandwidth edge*

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Basic Limit* (NOTE 5, 6) | Measurement bandwidth (NOTE 10) |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.16 MHz | 0.065 MHz ≤ f\_offset < 0.175 MHz |  | 30 kHz |
| NOTE 4: The limits in this table only apply for operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*.  NOTE 5: For a MSR *TAB connector* supporting *non-contiguous spectrum* operation within any operating band the *basic limit* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*.  NOTE 6: For a MSR *multi-band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*. | | | |

The following notes are common to all subclauses in 6.6.5.2.3:

NOTE 9: This frequency range ensures that the range of values of f\_offset is continuous.

NOTE 10: As a general rule for the requirements in the present subclause, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

NOTE 11: The requirement is not applicable when Δfmax < 10 MHz.

NOTE 12: All limits in table 6.6.5.2.3‑1, table 6.6.5.2.3‑3, table 6.6.5.2.3‑4 and table 6.6.5.2.3‑7 are identical to the corresponding limits for Band Category 1 and 3.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*End of change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next changed section\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 9.7.5.2 Minimum requirement for MSR operation

##### 9.7.5.2.1 General

The MSR operating band unwanted emission minimum requirements are given in subclauses 9.7.5.2.2, 9.7.5.2.3, and 9.7.5.2.4.

##### 9.7.5.2.2 Minimum requirements for Band Categories 1 and 3

For an MSR RIB operating in BC1 or BC3 bands, the minimum requirements are specified in tables 9.7.5.2.2-1 to 9.7.5.2.2-4, dependent on BS class and output power.

Applicability of Wide Area operating band unwanted emission requirements in tables 9.7.5.2.2-1, 9.7.5.2.2-1a and 9.7.5.2.2-1b is specified in table 9.7.5.2.2-0.

Table 9.7.5.2.2-0: Applicability of operating band unwanted emission requirements for BC1 and BC3 Wide Area BS

|  |  |  |
| --- | --- | --- |
| NR band operation | UTRA supported (NOTE 1) | Applicable requirement table |
| None | Y/N | 9.7.5.2.2-1 |
| In certain regions (NOTE 2), bands 3, 8 | N | 9.7.5.2.2-1 |
| Any below 1 GHz except for certain regions (NOTE 2), band 8 | N | 9.7.5.2.2-1a |
| Any above 1 GHz except for certain regions (NOTE 2), band 3 | N | 9.7.5.2.2-1b |
| NOTE 1: NR operation with UTRA is not supported in this version of specification.  NOTE 2: Applicable only for operation in regions where Category B limits as defined in ITU-R Recommendation SM.329 [14] are used for which category B option 2 operating band unwanted emissions requirements as defined in TS 36.104 [8] and TS 38.104 [27] are applied. | | |

Table 9.7.5.2.2-1: Wide Area BS operating band unwanted emission mask (UEM) in BC1 and BC3 bands applicable for: BS not supporting NR; or BS supporting NR in Band n1

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 1, 2)** | **Measurement bandwidth (NOTE 4)** |
| 0 MHz ≤ Δf < 0.2 MHz | 0.015MHz ≤ f\_offset < 0.215MHz | -5 dBm | 30 kHz |
| 0.2 MHz ≤ Δf < 1 MHz | 0.215MHz ≤ f\_offset < 1.015MHz |  | 30 kHz |
| (NOTE 3) | 1.015MHz ≤ f\_offset < 1.5 MHz | -17 dBm | 30 kHz |
| 1 MHz ≤ Δf ≤  min(Δfmax, 10 MHz) | 1.5 MHz ≤ f\_offset < min(f\_offsetmax, 10.5 MHz) | -4 dBm | 1 MHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -6 dBm (NOTE 5) | 1 MHz |
| NOTE 1: For MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *minimum requirement* within *sub-block gaps* shall be -6dBm/MHz.  NOTE2: For MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth. | | | |

Table 9.7.5.2.2-1a: Wide Area BS operating band unwanted emission mask (UEM) in BC1 and BC3 bands ≤ 1 GHz applicable for: BS supporting NR and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement(Note 1, 2) | Measurement bandwidth (Note 4) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -5 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -7 dBm (Note 5) | 100 kHz |
| NOTE 1: For MSR *RIB* supporting non-contiguous spectrum operation within any operating band, the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth*. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the sub-block gap, where the *minimum requirement* within sub-block gaps shall be -7dBm/100kHz.  NOTE 2: For MSR *multi band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or Base station *RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth*.  NOTE 3: For operation with an E-UTRA 1.4 or 3MHz carrier adjacent to the Base Station RF Bandwidth edge, the limits in Table 6.6.2.2-2 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 9.7.5.2.2-1b: Wide Area BS operating band unwanted emission mask (UEM) in BC1 and BC3 bands > 1 GHz applicable for: BS supporting NR, not operating NR in band n1, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement(Note 1, 2) | Measurement bandwidth (Note 4) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -5 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -6 dBm (Note 5) | 1MHz |
| NOTE 1: For MSR *RIB* supporting non-contiguous spectrum operation within any operating band, the *minimum requirement* within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *minimum requirement* within sub-block gaps shall be -6dBm/1MHz.  NOTE 2: For MSR *multi band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *basic limit* within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth.*  NOTE 3: For operation with an E-UTRA 1.4 or 3MHz carrier adjacent to the Base Station RF Bandwidth edge, the limits in Table 6.6.2.2-2 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 9.7.5.2.2-2: Medium Range BS operating band unwanted emission mask (UEM) in BC1 bands applicable for: BS with maximum output power 40 < Prated,c,TRP ≤ 47 dBm and not supporting NR

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 1, 2)** | **Measurement bandwidth (NOTE 4)** |
| 0 MHz ≤ Δf < 0.6 MHz | 0.015MHz ≤ f\_offset < 0.615MHz | Prated,c,TRP – 58 dB-(5/3)\*(f\_offset-0,015)dB | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz | Prated,c,TRP - 53 dB-15\*(f\_offset-0,015)dB | 30 kHz |
| (NOTE 3) | 1.015MHz ≤ f\_offset < 1.5 MHz | Prated,c,TRP – 65 dB | 30 kHz |
| 1 MHz ≤ Δf ≤ 2.6 MHz | 1.5 MHz ≤ f\_offset < 3.1 MHz | Prated,c,TRP –52 dB | 1 MHz |
| 2.6 MHz ≤ Δf ≤ 5 MHz | 3.1 MHz ≤ f\_offset < 5.5 MHz | min(Prated,c,TRP – 52 dB, -6dBm) | 1 MHz |
| 5 MHz ≤ Δf ≤ Δfmax | 5.5 MHz ≤ f\_offset < f\_offsetmax | Prated,c,TRP –56 dB | 1 MHz |
| NOTE 1: For MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *minimum requirement* within *sub-block gaps* shall be (Prated,c,TRP - 56 dB) /MHz.  NOTE 2: For MSR multi-band *RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*. | | | |

Table 9.7.5.2.2-2a: Medium Range BS operating band unwanted emission mask (UEM) in BC1 bands applicable for: BS with maximum output power 40 < Prated,c,TRP ≤ 47 dBm BS, supporting NR, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | *Minimum requirement* (Note 1, 2) | Measurement bandwidth (Note 4) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | Prated,c,TRP – 53 dB - (7/5)\*(f\_offset-0,05) dB | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | Prated,c,TRP – 60 dB | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | Min(Prated,c,TRP – 60 dB, -16 dBm) (Note 4) | 100 kHz |
| NOTE 1: For MSR *RIB* supporting non-contiguous spectrum operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *minimum requirement* within sub-block gaps shall be Min(Prated,c,TRP – 60 dB, -16 dBm)/100 kHz.  NOTE 2: For MSR *multi band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requriement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. | | | |

Table 9.7.5.2.2-3: Medium Range BS operating band unwanted emission mask (UEM) in BC1 bands applicable for: BS with maximum output power Prated,c,TRP ≤ 40 dBm and not supporting NR

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 1, 2)** | **Measurement bandwidth (NOTE 4)** |
| 0 MHz ≤ Δf < 0.6 MHz | 0.015MHz ≤ f\_offset < 0.615MHz |  | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz |  | 30 kHz |
| (NOTE 3) | 1.015MHz ≤ f\_offset < 1.5 MHz | -25 dBm | 30 kHz |
| 1 MHz ≤ Δf ≤ 5 MHz | 1.5 MHz ≤ f\_offset < 5.5 MHz | -12 dBm | 1 MHz |
| 5 MHz ≤ Δf ≤ Δfmax | 5.5 MHz ≤ f\_offset < f\_offsetmax | -16 dBm | 1 MHz |
| NOTE 1: For MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *minimum requirement* within *sub-block gaps* shall be -16 dBm/MHz.  NOTE 2: For MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*. | | | |

Table 9.7.5.2.2-3a: Medium Range BS operating band unwanted emission mask (UEM) in BC1 bands applicable for: BS with maximum output power Prated,c,TRP ≤ 40 dBm, supporting NR, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (Note 1, 2) | Measurement bandwidth (Note 4) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | -13 dBm – 7/5(f\_offset/MHz – 0.05) dB | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -20 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -20 dBm (Note 4) | 100 kHz |
| NOTE 1: For MSR *RIB*  supporting non-contiguous spectrum operation within any operating band the *minimum requriement*  within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *minimum requirement* within sub-block gaps shall be -20 dBm/100 kHz.  NOTE 2: For MSR *multi band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of the *Inter RF Bandwidth* gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. | | | |

Table 9.7.5.2.2-4: Local Area BS operating band unwanted emission mask (UEM) in BC1 bands

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 1, 2)** | **Measurement bandwidth (NOTE 4)** |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -28 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -28 dBm (NOTE 5) | 100 kHz |
| NOTE 1: For MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *minimum requirement* within *sub-block gaps* shall be -28dBm/100 kHz.  NOTE 2: For MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*. | | | |

NOTE 3: This frequency range ensures that the range of values of f\_offset is continuous.

NOTE 4: As a general rule for the requirements in the present subclause, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

NOTE 5: The requirement is not applicable when Δfmax < 10 MHz.

##### 9.7.5.2.3 *Minimum requirement* for Band Category 2

For an MSR RIB operating in BC2 bands, the minimum requirements are specified in tables 9.7.5.2.3-1 to 9.7.5.2.3-8.

Applicability of Wide Area operating band unwanted emission requirements in tables 9.7.5.2.3-1, 9.7.5.2.3-1a and 9.7.5.2.3-1b is specified in table 9.7.5.2.3-0.

Table 9.7.5.2.3-0: Applicability of operating band unwanted emission requirements for BC1 and BC3 Wide Area BS

|  |  |  |
| --- | --- | --- |
| NR band operation | UTRA supported (NOTE 1) | Applicable requirement table |
| None | Y/N | 9.7.5.2.3-1 |
| In certain regions (NOTE 2), bands 3, 8 | N | 9.7.5.2.3-1 |
| Any below 1 GHz except for certain regions (NOTE 2), band 8 | N | 9.7.5.2.3-1a |
| Any above 1 GHz except for certain regions (NOTE 2), band 3 | N | 9.7.5.2.3-1b |
| NOTE 1: NR operation with UTRA is not supported in this version of specification.  NOTE 2: Applicable only for operation in regions where Category B limits as defined in ITU-R Recommendation SM.329 [14] are used for which category B option 2 operating band unwanted emissions requirements as defined in TS 36.104 [8] and TS 38.104 [27] are applied. | | |

Table 9.7.5.2.3-1: Wide Area BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS not supporting NR; or BS supporting NR in Band n3 or n8

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 2, 3)** | **Measurement bandwidth (NOTE 10)** |
| 0 MHz ≤ Δf < 0.2 MHz  (NOTE 1) | 0.015 MHz ≤ f\_offset < 0.215 MHz | -5 dBm | 30 kHz |
| 0.2 MHz ≤ Δf < 1 MHz | 0.215 MHz ≤ f\_offset < 1.015 MHz |  | 30 kHz |
| (NOTE 9) | 1.015 MHz ≤ f\_offset < 1.5 MHz | -17 dBm | 30 kHz |
| 1 MHz ≤ Δf ≤  min(Δfmax, 10 MHz) | 1.5 MHz ≤ f\_offset < min(f\_offsetmax, 10.5 MHz) | -4 dBm | 1 MHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -6 dBm (NOTE 11) | 1 MHz |
| NOTE 1: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 9.7.5.2.3-2 apply for 0 MHz ≤ Δf < 0.15 MHz.  NOTE 2: For MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *minimum requirement* within *sub-block gaps* shall be -6dBm/MHz.  NOTE 3: For a MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE operation the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*. | | | |

Table 9.7.5.2.3-1a: Wide Area BS operating band unwanted emission mask (UEM) in BC2 bands ≤ 1 GHz applicable for: BS supporting NR, not operating NR in band n8, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (Note 1, 2) | Measurement bandwidth (Note 10) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | 2 dBm – 7/5(f\_offset/MHz – 0.05) dB | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -5 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -7 dBm (Note 11) | 100 kHz |
| NOTE 1: For MSR *RIB* supporting non-contiguous spectrum operation within any operating band, the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block or *RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth*. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the minimum requirement within sub-block gaps shall be -7 dBm/100 kHz.  NOTE 2: For MSR *multi band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the minimum requirement within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth.*  NOTE 3: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 9.7.5.2.3-2 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 9.7.5.2.3-1b: Wide Area BS operating band unwanted emission mask (UEM) in BC2 bands > 1 GHz applicable for: BS supporting NR, not operating NR in band n3, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (Note 1, 2) | Measurement bandwidth (Note 10) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | 2 dBm – 7/5(f\_offset/MHz – 0.05) dB | 100 kHz |
| 5 MHz ≤ Δf <  min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset <  min(10.05 MHz, f\_offsetmax) | -5 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.5 MHz ≤ f\_offset < f\_offsetmax | -7 dBm (Note 11) | 1MHz |
| NOTE 1: For MSR *RIBs* supporting non-contiguous spectrum operation within any operating band, the minimum requirementwithin *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the minimum requirement within sub-block gaps shall be -7dBm/1MHz.  NOTE 2: For MSR *multi band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the minimum requirement within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *RF Bandwidth.*  NOTE 3: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 9.7.5.2.3-2 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 9.7.5.2.3-2: Wide Area BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS operating with E-UTRA 1.4 or 3 MHz carriers adjacent to the *Base Station RF Bandwidth edge*

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 2, 3)** | **Measurement bandwidth (NOTE 10)** |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.15 MHz | 0.065 MHz ≤ f\_offset < 0.165 MHz |  | 30 kHz |
| NOTE 1: The limits in this table only apply for operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge.*  NOTE 2: For MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*.  NOTE 3: For a MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*.  NOTE 4: (Void) | | | |

Table 9.7.5.2.3-3: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power 40 < Prated,c,TRP ≤ 47 dBm and not supporting NR

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 2, 3)** | **Measurement bandwidth (NOTE 10)** |
| 0 MHz ≤ Δf < 0.6 MHz  (NOTE 1) | 0.015MHz ≤ f\_offset < 0.615MHz | Prated,c,TRP-58dB-(5/3)\*(f\_offset-0,015)dB | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz | Prated,c,TRP-53dB-15\*(f\_offset-0,215)dB | 30 kHz |
| (NOTE 9) | 1.015MHz ≤ f\_offset < 1.5 MHz | Prated,c,TRP  - 65 dB | 30 kHz |
| 1 MHz ≤ Δf ≤ 2.8 MHz | 1.5 MHz ≤ f\_offset < 3.3 MHz | Prated,c,TRP  - 52 dB | 1 MHz |
| 2.8 MHz ≤ Δf ≤ 5 MHz | 3.3 MHz ≤ f\_offset < 5.5 MHz | Prated,c,TRP  - 52 dB, -6dBm) | 1 MHz |
| 5 MHz ≤ Δf ≤ Δfmax | 5.5 MHz ≤ f\_offset < f\_offsetmax | Prated,c,TRP  - 56 dB | 1 MHz |
| NOTE 1: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 9.7.5.2.3-5 apply for 0 MHz ≤ Δf < 0.15 MHz.  NOTE 2: For a MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *minimum requirement* within *sub-block gaps* shall be (Prated,c,TRP - 56 dB)/MHz.  NOTE 3: For a MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of *the Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*. | | | |

Table 9.7.5.2.3-3a: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power 40 < Prated,c,TRP ≤ 47 dBm, supporting NR, and not supporting UTRA,

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (Note 1, 2) | Measurement bandwidth (Note 10) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | Prated,c,TRP – 53 dB - (7/5)\*(f\_offset-0,05) dB | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | Prated,c,TRP – 60 dB | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | Min(Prated,c,TRP – 60 dB, -16 dBm) (Note 11) | 100 kHz |
| NOTE 1: For MSR *RIBs* supporting non-contiguous spectrum operation within any operating band the minimum requirement within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the minimum requirement within sub-block gaps shall be Min(Prated,c,TRP - 60 dB, -16 dBm)/100 kHz.  NOTE 2: For MSR *multi band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the minimum requirement within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of *the Inter RF Bandwidth gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block.  NOTE 3: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 9.7.5.2.3-5 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 9.7.5.2.3-4: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power Prated,c,TRP ≤ 40 dBm and not supporting NR.

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 2, 3)** | **Measurement bandwidth (NOTE 10)** |
| 0 MHz ≤ Δf < 0.6 MHz  (NOTE 1) | 0.015MHz ≤ f\_offset < 0.615MHz |  | 30 kHz |
| 0.6 MHz ≤ Δf < 1 MHz | 0.615MHz ≤ f\_offset < 1.015MHz |  | 30 kHz |
| (NOTE 9) | 1.015MHz ≤ f\_offset < 1.5 MHz | -25 dBm | 30 kHz |
| 1 MHz ≤ Δf ≤ 5 MHz | 1.5 MHz ≤ f\_offset < 5.5 MHz | -12 dBm | 1 MHz |
| 5 MHz ≤ Δf ≤ Δfmax | 5.5 MHz ≤ f\_offset < f\_offsetmax | -16 dBm | 1 MHz |
| NOTE 1: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 6.6.2.2-6 apply for 0 MHz ≤ Δf < 0.15MHz.  NOTE 2: For a MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub-blocks on each side of the *sub-block gap*, where the *minimum requirement* within *sub-block gaps* shall be -16dBm/MHz.  NOTE 3: For a MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block or *Base Station RF Bandwidth* shall be scaled according to the measurement bandwidth of the near-end sub-block or *Base Station RF Bandwidth*. | | | |

Table 9.7.5.2.3-4a: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS maximum output power Prated,c,TRP ≤ 40 dBm, supporting NR, and not supporting UTRA

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (Note 1, 2) | Measurement bandwidth (Note 10) |
| 0 MHz ≤ Δf < 5 MHz | 0.05 MHz ≤ f\_offset < 5.05 MHz | -13 dBm – 7/5(f\_offset/MHz – 0.05) dB | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -20 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -20 dBm (Note 11) | 100 kHz |
| NOTE 1: For MSR *RIBs* supporting non-contiguous spectrum operation within any operating band the minimum requirement within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub block gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the minimum requirement within sub-block gaps shall be -20 dBm/100 kHz.  NOTE 2: For MSR *multi band TAB connector* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the minimum requirement within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *RF Bandwidth* on each side of the *Inter RF Bandwidth gap*, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block.  NOTE 3: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 9.7.5.2.3-6 apply for 0 MHz ≤ Δf < 0.15 MHz. | | | |

Table 9.7.5.2.3-5: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power 40 < Prated,c,TRP ≤ 47 dBm and operating with E-UTRA 1.4 or 3 MHz carriers adjacent to the *Base Station RF Bandwidth edge*

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 2, 3)** | **Measurement bandwidth (NOTE 10)** |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz | Prated,c,TRP-38dB-60\*(f\_offset-0,015)dB | 30 kHz |
| 0.05 MHz ≤ Δf < 0.15 MHz | 0.065 MHz ≤ f\_offset < 0.165 MHz | Prated,c,TRP-41dB-160\*(f\_offset-0,065)dB | 30 kHz |
| NOTE 1: The limits in this table only apply for operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*.  NOTE 2: For a MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*.  NOTE 3: For a MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*. | | | |

Table 9.7.5.2.3-6: Medium Range BS operating band unwanted emission mask (UEM) in BC2 bands applicable for: BS with maximum output power Prated,c,TRP ≤ 40 dBm and operating E-UTRA 1.4 or 3 MHz carriers adjacent to the *Base Station RF Bandwidth edge*

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 2, 3)** | **Measurement bandwidth (NOTE 10)** |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.15 MHz | 0.065 MHz ≤ f\_offset < 0.165 MHz |  | 30 kHz |
| NOTE 1: The limits in this table only apply for operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*.  NOTE 2: For a MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*.  NOTE 3: For a MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*.  NOTE 4: (Void) | | | |

Table 9.7.5.2.3-7: Local Area BS operating band unwanted emission mask (UEM) in BC2 bands

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency offset of measurement filter ‑3dB point, Δf** | **Frequency offset of measurement filter centre frequency, f\_offset** | **Minimum requirement (NOTE 2, 3)** | **Measurement bandwidth (NOTE 10)** |
| 0 MHz ≤ Δf < 5 MHz  (NOTE 1) | 0.05 MHz ≤ f\_offset < 5.05 MHz |  | 100 kHz |
| 5 MHz ≤ Δf < min(10 MHz, Δfmax) | 5.05 MHz ≤ f\_offset < min(10.05 MHz, f\_offsetmax) | -28 dBm | 100 kHz |
| 10 MHz ≤ Δf ≤ Δfmax | 10.05 MHz ≤ f\_offset < f\_offsetmax | -28 dBm (NOTE 11) | 100 kHz |
| NOTE 1: For operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*, the limits in table 9.7.5.2.3-8 apply for 0 MHz ≤ Δf < 0.16 MHz.  NOTE 2: For a MSR RIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*. Exception is f ≥ 10MHz from both adjacent sub blocks on each side of the *sub-block gap*, where the *minimum requirement* within *sub-block gaps* shall be -28dBm/100 kHz.  NOTE 3: For a MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*. | | | |

Table 9.7.5.2.3-8: Local Area BS operating band unwanted emission mask (UEM) for operation in BC2 bands applicable for: BS operating with E-UTRA 1.4 or 3 MHz carriers adjacent to the *Base Station RF Bandwidth edge*

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency offset of measurement filter ‑3dB point, Δf | Frequency offset of measurement filter centre frequency, f\_offset | Minimum requirement (NOTE 2, 3) | Measurement bandwidth (NOTE 10) |
| 0 MHz ≤ Δf < 0.05 MHz | 0.015 MHz ≤ f\_offset < 0.065 MHz |  | 30 kHz |
| 0.05 MHz ≤ Δf < 0.16 MHz | 0.065 MHz ≤ f\_offset < 0.175 MHz |  | 30 kHz |
| NOTE 1: The limits in this table only apply for operation with an E-UTRA 1.4 or 3 MHz carrier adjacent to the *Base Station RF Bandwidth edge*.  NOTE 2: For a MSRRIB supporting *non-contiguous spectrum* operation within any operating band the *minimum requirement* within *sub-block gaps* is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the *sub-block gap*.  NOTE 3: For a MSR *multi-band RIB* with *Inter RF Bandwidth gap* < 2×ΔfOBUE the *minimum requirement* within the *Inter RF Bandwidth gaps* is calculated as a cumulative sum of contributions from adjacent sub-blocks or *Base Station RF Bandwidth* on each side of the *Inter RF Bandwidth gap*.  NOTE 4: (Void) | | | |

The following notes are common to all subclauses in 9.7.5.2.3:

NOTE 9: This frequency range ensures that the range of values of f\_offset is continuous.

NOTE 10: As a general rule for the requirements in the present subclause, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

NOTE 11: The requirement is not applicable when Δfmax < 10 MHz.

NOTE 12: All limits in table 9.7.5.2.3‑1, table 9.7.5.2.3‑3, table 9.7.5.2.3‑4 and table 9.7.5.2.3‑7 are identical to the corresponding limits for Band Category 1 and 3.