## 3.5 Cumulative adjacent channel leakage ratio (CACLR)

The following test requirement applies for sub-block or Inter RF Bandwidth gap sizes listed in Table 3.5-1:

– Inside a sub-block gap within an operating band for a BS operating in non-contiguous spectrum.

– Inside an Inter RF Bandwidth gap for a BS operating in multiple bands, where multiple bands are mapped on the same antenna connector.

The cumulative adjacent channel leakage power ratio (CACLR) in a sub-block gap or the Inter RF Bandwidth gap is the ratio of

a) the sum of the filtered mean power centred on the assigned channel frequencies for the two carriers adjacent to each side of the sub-block gap or the Inter RF Bandwidth gap, and

b) the filtered mean power centred on a frequency channel adjacent to one of the respective sub-block edges or RF bandwidth edges.

The requirement applies to adjacent channels of E-UTRA or UTRA carriers allocated adjacent to each side of the sub-block gap or the Inter RF Bandwidth gap. The assumed filter for the adjacent channel frequency is defined in Table 3.5-1 and the filters on the assigned channels are defined in Table 3.5-2.

NOTE – If the RAT on the assigned channel frequencies are different, the filters used are also different.

For wide area category A BS, either the CACLR limits in Table 3.5-1 or the absolute limit of   
−13dBm/MHz shall apply, whichever is less stringent.

For Wide Area Category B BS, either the CACLR limits in Table 3.5-1 or the absolute limit of  
−15 dBm/MHz shall apply, whichever is less stringent.

For Medium Range BS, either the CACLR limits in Table 3.5-1 or the absolute limit of  
−25 dBm/MHz shall apply, whichever is less stringent.

For local area BS, either the CACLR limits in Table 3.5-1 or the absolute limit of −32 dBm/MHz shall apply, whichever is less stringent.

The CACLR for E-UTRA and UTRA carriers located on either side of the sub-block gap or the Inter RF Bandwidth gap shall be higher than the value specified in Table 3.5-1:

TABLE 3.5-1

Base station CACLR in non-contiguous spectrum or multiple bands

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Band category | Sub-block or Inter RF Bandwidth gap size (*Wgap*) where the limit applies | BS adjacent channel centre frequency offset below or above the sub-block edge or the Base Station RF bandwidth edge (inside the gap) | Assumed adjacent channel carrier (informative) | Filter on the adjacent channel frequency and corresponding filter bandwidth | CACLR limit |
| BC1, BC2 | 5 MHz ≤ *Wgap* < 15 MHz  (Note 3) | 2.5 MHz | 3.84 Mcps UTRA | RRC (3.84 Mcps) | 44.2 dB |
| BC1, BC2 | 10 MHz ≤ *Wgap* < 20 MHz  (Note 3) | 7.5 MHz | 3.84 Mcps UTRA | RRC (3.84 Mcps) | 44.2 dB |
| BC3 | 5 ≤ Wgap < 15 MHz (Note 3) | 2.5 MHz | 5MHz E-UTRA | Square (*BWConfig*) | 44.2 dB |
| BC3 | 10 < Wgap < 20 MHz (Note 3) | 7.5 MHz | 5MHz E-UTRA | Square (*BWConfig*) | 44.2 dB |
| BC1, BC2, BC3 | 5 MHz ≤ *Wgap* < 45 MHz  (Note 4) | 2.5 MHz | 5 MHz NR (Note 2) | Square (*BWConfig*) | 44.2 dB |
| BC1, BC2, BC3 | 10 ≤ Wgap < 50 MHz (Note 4) | 7.5 MHz | 5 MHz NR (Note 2) | Square (*BWConfig*) | 44.2 dB |
| BC1, BC2,  BC3 | 20 MHz < *Wgap* < 30 MHz  (Note 3, 5) | 10 MHz | 20 MHz NR (Note 2) | Square (*BWConfig*) | 44.2 dB |
| BC1, BC2, BC3 | 20 ≤ Wgap < 60 MHz (Note 4) | 10 MHz | 20 MHz NR (Note 2) | Square (*BWConfig*) | 44.2 dB |
| BC1, BC2, BC3 | 40 ≤ Wgap < 50 MHz (Note 3, 5) | 30 MHz | 20 MHz NR (Note 2) | Square (*BWConfig*) | 44.2 dB |
| BC1, BC2, BC3 | 40 ≤ Wgap < 80 MHz (Note 4) | 30 MHz | 20 MHz NR (Note 2) | Square (*BWConfig*) | 44.2 dB |
| NOTE 1 – For BC1 and BC2 the RRC filter shall be equivalent to the transmit pulse shape filter defined in 3GPP TS 25.104, with a chip rate as defined in this table.  NOTE 2 – With SCS that provides largest transmission bandwidth configuration (BWConfig).  NOTE 3 – Applicable in case the channel bandwidth of the carrier transmitted at the other edge of the gap is 5, 10, 15, 20 MHz.  NOTE 4 – Applicable in case the channel bandwidth of the NR carrier transmitted at the other edge of the gap is 25, 30, 40, 50, 60, 70, 80, 90, 100 MHz.  NOTE 5 – Applicable in case the *channel bandwidth* of the lowest/highest NR carrier transmitted is 25, 30, 40, 50, 60, 70, 80, 90, 100 MHz. | | | | | |

TABLE 3.5-2

Filter parameters for the assigned channel

|  |  |
| --- | --- |
| RAT of the carrier adjacent to the sub-block or Inter RF Bandwidth gap | Filter on the assigned channel frequency and corresponding filter bandwidth |
| E-UTRA | E-UTRA of same BW |
| UTRA FDD | RRC (3.84 Mcps) |
| NR | NR of same BW with SCS that provides largest transmission bandwidth configuration |
| NOTE 1 – The RRC filter shall be equivalent to the transmit pulse shape filter defined in  3GPP TS 25.104, with a chip rate as defined in this table. | |

## 3.6 Transmitter spurious emissions

The test requirements of either clause § 3.6.1 (category A limits) or § clause 3.6.2 (category B limits) shall apply. In addition for a BS operating in band category 2, the test requirements of 3.6.1.3 shall apply in case of category B limits.

### 3.6.1 Spurious emissions (category A)

The power of any spurious emission shall not exceed the limits in Table 3.6.1-1.

TABLE 3.6.1-1

BS spurious emission limits, Category A

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum level | Measurement bandwidth | Note |
| 9 kHz – 150 kHz | −13 dBm | 1 kHz | Note 1 |
| 150 kHz – 30 MHz | 10 kHz | Note 1 |
| 30 MHz – 1 GHz | 100 kHz | Note 1 |
| 1 GHz – 12.75 GHz | −13 dBm | 1 MHz | Note 2 |
| 12.75 GHz – 5th harmonic of the upper frequency edge of the DL operating band in GHz | 1 MHz | Notes 2, 3 |
| NOTE 1 – Bandwidth as in Recommendation ITU-R SM.329, § 4.1.  NOTE 2 – Bandwidth as in Recommendation ITU-R SM.329, § 4.1. Upper frequency as in Recommendation ITU-R SM.329, § 2.5, Table 1.  NOTE 3 – This spurious frequency range applies only for *operating bands* for which the 5th harmonic of the upper frequency edge of the DL *operating band* is reaching beyond 12.75 GHz. | | | |

### 3.6.2 Spurious emissions (category B)

The power of any spurious emission shall not exceed the limits in Table 3.6.2-1

TABLE 3.6.2-1

BS Spurious emissions limits, Category B

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum level | Measurement bandwidth | Note |
| 9 kHz ↔ 150 kHz | −36 dBm | 1 kHz | Note 1 |
| 150 kHz ↔ 30 MHz | −36 dBm | 10 kHz | Note 1 |
| 30 MHz ↔ 1 GHz | −36 dBm | 100 kHz | Note 1 |
| 1 GHz ↔ 12.75 GHz | −30 dBm | 1 MHz | Note 2 |
| 12.75 GHz ↔ 5th harmonic of the upper frequency edge of the DL operating band in GHz | −30 dBm | 1 MHz | Notes 2, 3 |
| NOTE 1 – Bandwidth as in Recommendation ITU-R SM.329, § 4.1.  NOTE 2 – Bandwidth as in Recommendation ITU-R SM.329, § 4.1. Upper frequency as in Recommendation ITU-R SM.329, § 2.5 Table 1.  NOTE 3 – This spurious frequency range applies only for *operating bands* for which the 5th harmonic of the upper frequency edge of the DL *operating band* is reaching beyond 12.75 GHz. | | | |

### 3.6.3 Protection of the BS receiver of own or different BS

This requirement shall be applied for FDD operation in order to prevent the receivers of base stations being desensitised by emissions from the BS transmitter. It is measured at the transmit antenna port for any type of BS which has common or separate Tx/Rx antenna ports.

The power of any spurious emission shall not exceed the limits in Table 3.6.3-1, depending on the declared base station class and band category.

TABLE 3.6.3-1

BS Spurious emissions limits for protection of the BS receiver

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| BS Class | Band category | Frequency range | Maximum level | Measurement bandwidth | Note |
| Wide area BS | BC1 | *FUL\_low* – *FUL\_high* | −96 dBm | 100 kHz | – |
| Wide area BS | BC2 | *FUL\_low* – *FUL\_high* | −98 dBm | 100 kHz | – |
| Medium range BS | BC1,BC2 | *FUL\_low* – *FUL\_high* | −91 dBm | 100 kHz | – |
| Local area BS | BC1,BC2 | *FUL\_low* – *FUL\_high* | −88 dBm | 100 kHz | – |
| NOTE 1 – For E-UTRA Band 28 BS operating in regions where Band 28 is only partially allocated for E-UTRA operations, this requirement only applies in the UL frequency range of the partial allocation. | | | | | |

### 3.6.4 Additional spurious emission requirements

These requirements may be applied for the protection of system operating in frequency ranges other than the BS downlink operating band. The limits may apply as an optional protection of such systems that are deployed in the same geographical area as the BS, or they may be set by local or regional regulation as a mandatory requirement for an operating band. It is in some cases not stated in the present document whether a requirement is mandatory or under what exact circumstances that a limit applies, since this is set by local or regional regulation.

Some requirements may apply for the protection of specific equipment (UE, MS and/or BS) or equipment operating in specific systems (GSM/EDGE, CDMA, UTRA, E-UTRA, NR, etc.) as listed below. The power of any spurious emission shall not exceed the limits of Table 3.6.4-1 for a BS where requirements for co-existence with the system listed in the first column apply.

For BS capable of multi-band operation, the exclusions and conditions in the Note column of Table 3.6.4-1 apply for each supported operating band. For BS capable of multi-band operation where multiple bands are mapped on separate antenna connectors, the exclusions and conditions in the Note column of Table 3.6.4-1 apply for the operating band supported at that antenna connector.

TABLE 3.6.4-1

BS spurious emissions limits for co-existence with systems operating in other frequency bands

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| System type to  co-exist with | Frequency range for co-existence requirement | Maximum level | Measurement bandwidth | Note |
| GSM900 | 921‑960 MHz | −57 dBm | 100 kHz | This requirement does not apply to BS operating in Band 8 |
| 876-915 MHz | −61 dBm | 100 kHz | For the frequency range 880-915 MHz, this requirement does not apply to BS operating in Band 8 |
| DCS1800  (Note 3) | 1 805‑1 880 MHz | −47 dBm | 100 kHz | This requirement does not apply to BS operating in Band 3. |
| 1 710-1 785 MHz | −61 dBm | 100 kHz | This requirement does not apply to BS operating in Band 3. |
| PCS1900 | 1 930‑1 990 MHz | −47 dBm | 100 kHz | This requirement does not apply to BS operating in Band 2, 25, 36 or Band 70. |
| 1 850‑1 910 MHz | −61 dBm | 100 kHz | This requirement does not apply to BS operating in Band 2 or 25. This requirement does not apply to BS operating in Band 35. |

TABLE 3.6.4-1 (*continued*)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| System type to  co-exist with | Frequency range for co-existence requirement | Maximum level | Measurement bandwidth | Note |
| GSM850 or CDMA850 | 869-894 MHz | −57 dBm | 100 kHz | This requirement does not apply to BS operating in Band 5 or 26. This requirement applies to E-UTRA BS operating in Band 27 for the frequency range 879‑894 MHz. |
| 824‑849 MHz | −61 dBm | 100 kHz | This requirement does not apply to BS operating in Band 5 or 26. For BS operating in Band 27, it applies 3 MHz below the Band 27 downlink operating band. |
| UTRA FDD Band I or  E-UTRA Band 1 or NR Band n1 | 2 110-2 170 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 1 or 65. |
| 1 920-1 980 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 1 or 65. |
| UTRA FDD Band II or  E-UTRA Band 2 or NR Band n2 | 1 930-1 990 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 2, 25 or 70. |
|  | 1 850-1 910 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 2 or 25. |
| UTRA FDD Band III or  E-UTRA Band 3 or NR Band n3 (Note 3) | 1 805-1 880 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 3 or 9. |
| 1 710-1 785 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 3.  For BS operating in band 9, it applies for 1710 MHz to 1749.9 MHz and 1784.9 MHz to 1785 MHz. |
| UTRA FDD Band IV or  E-UTRA Band 4 | 2 110-2 155 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 4, 10 or 66. |
| 1 710-1 755 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 4, 10 or 66. |
| UTRA FDD Band V or  E-UTRA Band 5  or NR Band n5 | 869-894 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 5 or 26. This requirement applies to E-UTRA BS operating in Band 27 for the frequency range 879‑894 MHz. |
| 824-849 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 5 or 26. For BS operating in Band 27, it applies 3 MHz below the Band 27 downlink operating band. |

TABLE 3.6.4-1 (*continued*)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| System type to  co-exist with | Frequency range for co-existence requirement | Maximum level | Measurement bandwidth | Note |
| UTRA FDD Band VI, XIX or  E-UTRA Bands 6, 18, 19 or NR Band n18 | 860-890 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Bands 6, 18, 19. |
| 815-830 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 18. |
| 830-845 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 6, 19. |
| UTRA FDD Band VII or  E-UTRA Band 7  or NR Band n7 | 2 620-2 690 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 7. |
| 2 500-2 570 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 7. |
| UTRA FDD Band VIII or  E-UTRA Band 8  or NR Band n8 | 925-960 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 8. |
| 880-915 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 8. |
| UTRA FDD Band IX or  E-UTRA Band 9 | 1 844.9-1 879.9 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 3 or 9. |
| 1 749.9-1 784.9 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 3 or 9. |
| UTRA FDD Band X or  E-UTRA Band 10 | 2 110-2 170 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 4, 10 or 66. |
| 1 710-1 770 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in band 10, 66. For BS operating in Band 4, it applies for 1 755 MHz to 1 770 MHz. |
| UTRA FDD Band XI or XXI or  E-UTRA Band 11 or 21 | 1 475.9-1 510.9 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 11, 21, 32, 50, 74 or 75. |
| 1 427.9-1 447.9 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 11 or 74. This requirement does not apply to BS operating in band 32, 50, 51, 75 or 76. |
| 1 447.9–1 462.9 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 21, 74. This requirement does not apply to BS operating in band 32, 50 or 75. |
| UTRA FDD Band XII or  E-UTRA Band 12 or NR Band n12 | 729-746 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 12 or 85. |
| 699-716 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 12 or 85. For BS operating in Band 29, it applies 1 MHz below the Band 29 downlink operating band (Note 7). |
| UTRA FDD Band XIII or  E-UTRA Band 13 | 746-756 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 13. |
| 777-787 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 13. |

TABLE 3.6.4-1 (*continued*)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| System type to  co-exist with | Frequency range for co-existence requirement | Maximum level | Measurement bandwidth | Note |
| UTRA FDD Band XIV or  E-UTRA Band 14 or NR Band n14 | 758-768 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 14. |
| 788-798 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 14. |
| E-UTRA Band 17 | 734-746 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 17. |
| 704-716 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 17. For BS operating in Band 29, it applies 1 MHz below the Band 29 downlink operating band (Note 7). |
| UTRA FDD Band XX or  E-UTRA Band 20 or NR Band n20 | 791-821 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 20 or 28. |
| 832-862 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 20. |
| UTRA FDD Band XXII or  E-UTRA Band 22 | 3 510–3 590 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 22, 42, 48, 49, 77 or 78. |
| 3 410–3 490 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 22. This requirement does not apply to Band 42, 77 or 78. |
|  |  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |
| E-UTRA Band 24 | 1 525-1 559 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 24. |
| 1626.5-1 660.5 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 24. |
| UTRA FDD Band XXV or E-UTRA Band 25 or NR Band n25 | 1 930-1 995 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 2, 25 or 70. |
| 1 850-1 915 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 25. For BS operating in Band 2, it applies for 1910 MHz to 1915 MHz. |

TABLE 3.6.4-1 (*continued*)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| System type to  co-exist with | Frequency range for co-existence requirement | Maximum level | Measurement bandwidth | Note |
| UTRA FDD Band XXVI or E-UTRA Band 26 or NR Band n26 | 859-894 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 5 or 26. This requirement applies to E-UTRA BS operating in Band 27 for the frequency range 879‑894 MHz. |
| 814-849 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 26. For BS operating in Band 5, it applies for 814 MHz to 824 MHz. For BS operating in Band 27, it applies 3 MHz below the Band 27 downlink operating band. |
| E-UTRA Band 27 | 852–869 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Bands 5, 26 or 27. |
| 807–824 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 27. For BS operating in Band 26, it applies for 807 MHz to 814 MHz. This requirement also applies to BS operating in Band 28, starting 4 MHz above the Band 28 downlink operating band (Note 6). |
| E-UTRA Band 28  or NR Band n28 | 758-803 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 20, 28, 44 or 67. |
| 703-748 MHz | −49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 28. This requirement does not apply to BS operating in Band 44. For BS operating in Band 67, it applies for 703-736MHz. For E-UTRA BS operating in Band 68, it applies for 728MHz to 733MHz. |
| E-UTRA Band 29  or NR Band n29 | 717–728 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 29 or 85. |
| E-UTRA Band 30  or NR Band n30 | 2 350-2 360 MHz | –52 dBm | 1 MHz | This requirement does not apply to BS operating in band 30 or 40. |
| 2 305-2 315 MHz | –49 dBm | 1 MHz | This requirement does not apply to BS operating in band 30. This requirement does not apply to BS operating in Band 40. |
| E-UTRA Band 31 | 462.5-467.5 MHz | –52 dBm | 1 MHz | This requirement does not apply to BS operating in band 31, 72 or 73. |
| 452.5-457.5 MHz | –49 dBm | 1 MHz | This requirement does not apply to BS operating in band 31. This requirement does not apply to BS operating in band 72 or 73. |
| UTRA FDD Band XXXII or E-UTRA Band 32 | 1 452-1 496 MHz | –52 dBm | 1 MHz | This requirement does not apply to BS operating in band 11, 21, 32, 50, 74 or 75. |
| UTRA TDD Band a) or E-UTRA Band 33 | 1 900-1 920 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 33. |
| UTRA TDD Band a) or E‑UTRA Band 34  or NR Band n34 | 2 010-2 025 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 34. |
| UTRA TDD Band b) or E‑UTRA Band 35 | 1 850–1 910 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 35. |

TABLE 3.6.4-1 (*end*)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| System type to  co-exist with | Frequency range for co-existence requirement | Maximum level | Measurement bandwidth | Note |
| UTRA TDD Band b) or E‑UTRA Band 36 | 1 930-1 990 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Bands 2, 25 or 36. | |
| UTRA TDD in Band c) or E-UTRA Band 37 | 1 910-1 930 MHz | −52 dBm | 1 MHz | This is not applicable to BS operating in Band 37. This unpaired band is defined in ITU-R M.1036, but is pending any future deployment. | |
| UTRA TDD Band d) or E-UTRA Band 38  or NR Band n38 | 2 570–2 620 MHz | −52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 38 or 69. | |
| UTRA TDD Band f) or E-UTRA Band 39  or NR Band n39 | 1 880–1 920MHz | −52 dBm | 1 MHz | This is not applicable to BS operating in Band  39. | |
| UTRA TDD Band e) or E-UTRA Band 40  or NR Band n40 | 2 300–2 400MHz | −52 dBm | 1 MHz | This is not applicable to BS operating in Band  30 or 40. | |
| E-UTRA Band 41  or NR Band n41 | 2 496–2 690MHz | −52 dBm | 1 MHz | This is not applicable to BS operating in Band  41 or 53. | |
| E-UTRA Band 42 | 3 400–3 600 MHz | −52 dBm | 1 MHz | This is not applicable to BS operating in Band 22, 42, 43, 48, 49, 52, 77 or 78. | |
| E-UTRA Band 43 | 3 600–3 800 MHz | −52 dBm | 1 MHz | This is not applicable to BS operating in Band  42, 43, 48, 49, 77 or 78. | |
| E-UTRA Band 44 | 703-803 MHz | −52 dBm | 1 MHz | This is not applicable to BS operating in Band  28 or 44. | |
| E-UTRA Band 45 | 1447 - 1467 MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band 45. | |
| E-UTRA Band 46 or NR Band n46 | 5150 - 5925 MHz | -52 dBm | 1 MHz |  | |
| E-UTRA Band 47 | 5855 - 5925 MHz | -52 dBm | 1 MHz |  | |
| E-UTRA Band 48 or NR Band n48 | 3550 – 3700 MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band 22, 42, 43, 48, 49, 77 or 78. | |
| E-UTRA Band 49 | 3550 – 3700 MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band 22, 42, 43, 48, 49, 77 or 78. | |
| E-UTRA Band 50 or NR Band n50 | 1432 - 1517 MHz | -52 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in Band 11, 21, 32, 45, 50, 51, 74, 75 or 76. | |
| E-UTRA Band 51 or NR Band n51 | 1427 - 1432 MHz | -52 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in Band 50, 51, 75 or 76. | |
| E-UTRA Band 52 | 3300 – 3400 MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band 42 or 52. | |
| E-UTRA Band 53 or NR Band n53 | 2483.5 - 2495 MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band 41 or 53. | |
| E-UTRA Band 65 or NR Band n65 | 2110 - 2200 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 1 or 65. | |
| 1920 - 2010 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 65. For BS operating in Band 1, it applies for 1980 MHz to 2010 MHz. | |
| E-UTRA Band 66 or NR Band n66 | 2110 - 2200 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 4, 10, 23 or 66. | |
| 1710 - 1780 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 66. For BS operating in Band 4, it applies for 1755 MHz to 1780 MHz. For BS operating in Band 10, it applies for 1770 MHz to 1780 MHz. | |
| E-UTRA Band 67 | 738 – 758 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 28 or 67. | |
| E-UTRA Band 68 | 753 -783 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 28 or 68. | |
| 698-728 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 68. For BS operating in Band 28, it applies between 698 MHz and 703 MHz. | |
| E-UTRA Band 69 | 2570 - 2620 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 38 or 69. | |
| E-UTRA Band 70 or NR Band n70 | 1995 - 2020 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 2, 25 or 70. | |
| 1695 – 1710 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 70. | |
| E-UTRA Band 71 or NR Band n71 | 617 - 652 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 71. | |
| 663 – 698 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 71. | |
| E-UTRA Band 72 | 461 - 466 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 31, 72 or 73. | |
| 451 - 456 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 72. This requirement does not apply to BS operating in band 73. | |
| E-UTRA Band 73 | 460 - 465 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 31, 72 or 73. | |
| 450 - 455 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 73. | |
| E-UTRA Band 74 or NR Band n74 | 1475 – 1518 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 11, 21, 32, 50, 74 or 75. | |
| 1427 – 1470 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in Band 74. This requirement does not apply to BS operating in band 32, 45, 50, 51, 75 or 76. | |
| E-UTRA Band 75 or NR Band n75 | 1432 - 1517 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 11, 21, 32, 45, 50, 51, 74, 75 or 76. | |
| E-UTRA Band 76 or NR Band n76 | 1427 - 1432 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 50, 51, 75 or 76. | |
| NR Band n77 | 3300 – 4200 MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band 22, 42, 43, 48, 49, 52, 77 or 78. | |
| NR Band n78 | 3300 – 3800 MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band 22, 42, 43, 48, 49, 52, 77 or 78. | |
| NR Band n79 | 4400 – 5000 MHz | -52 dBm | 1 MHz |  | |
| NR Band n80 | 1710 - 1785 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 3. For BS operating in band 9, it applies for 1710 MHz to 1749.9 MHz and 1784.9 MHz to 1785 MHz,. | |
| NR Band n81 | 880 - 915 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 8. | |
| NR Band n82 | 832 - 862 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 20. | |
| NR Band n83 | 703 - 748 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 28. This requirement does not apply to BS operating in Band 44. For BS operating in Band 67, it applies for 703-736MHz. For BS operating in Band 68, it applies for 728MHz to 733MHz. | |
| NR Band n84 | 1920 - 1980 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 1 or 65. | |
| E-UTRA Band 85 | 728 - 746 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 12, 29 or 85. | |
| 698 - 716 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 85. For BS operating in Band 29, it applies 1 MHz below the Band 29 downlink operating band (Note 7). | |
| NR Band n86 | 1710 - 1780 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 66. For BS operating in Band 4, it applies for 1755 MHz to 1780 MHz. For BS operating in Band 10, it applies for 1770 MHz to 1780 MHz. | |
| E-UTRA Band 87 | 420 - 425 MHz | -52 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 87 or 88. | |
| 410 – 415 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 87. | |
| E-UTRA Band 88 | 422 - 427 MHz | -52 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 87 or 88. | |
| 412 - 417 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 88. This requirement does not apply to E-UTRA BS operating in band 87. | |
| NR Band n89 | 824 - 849 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 5 or 26. For BS operating in Band 27, it applies 3 MHz below the Band 27 downlink operating band. | |
| NR Band n91 | 1427 – 1432 MHz | -52 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in Band 50, 51, 75 or 76. | |
| 832 – 862 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 20. | |
| NR Band n92 | 1432 – 1517 MHz | -52 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in Band 11, 21, 32, 45, 50, 51, 74, 75 or 76. | |
| 832 – 862 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 20. | |
| NR Band n93 | 1427 – 1432 MHz | -52 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in Band 50, 51, 75 or 76. | |
| 880 – 915 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 8. | |
| NR Band n94 | 1432 – 1517 MHz | -52 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in Band 11, 21, 32, 45, 50, 51, 74, 75 or 76. | |
| 880 – 915 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 8. | |
| NR Band n95 | 2010 - 2025 MHz | -52 dBm | 1 MHz |  | |
| NR Band n96 | 5925 - 7125 MHz | -52 dBm | 1 MHz |  | |
| NOTE 1 – As defined in the scope for spurious emissions in this subclause, except for the cases where the noted requirements apply to a BS operating in Band 25, Band 27, Band 28 or Band 29, the co-existence requirements in Table  3.6.4-1 do not apply for the 10 MHz frequency range immediately outside the downlink operating band. Emission limits for this excluded frequency range may be covered by local or regional requirements.  NOTE 2 – Table 3.6.4-1 assumes that two operating bands, where the frequency ranges would be overlapping, are not deployed in the same geographical area. For such a case of operation with overlapping frequency arrangements in the same geographical area, special co-existence requirements may apply that are not covered by these specifications.  NOTE 3 – For the protection of DCS1800, UTRA Band III or E-UTRA Band 3 or NR Band n3 in China, the frequency ranges of the downlink and uplink protection requirements are 1 805–1 850 MHz and 1 710‑1 755 MHz respectively.  NOTE 4 – TDD base stations deployed in the same geographical area, that are synchronized and use the same or adjacent operating bands can transmit without additional co-existence requirements. For unsynchronized (except in Band 46), base stations, special co-existence requirements may apply that are not covered by these specifications.  NOTE 5 – Void. | | | | | |
| NOTE 6 – For Band 28 BS, specific solutions may be required to fulfil the spurious emissions limits for BS for co-existence with Band 27 UL operating band.  NOTE 7 – For Band 29 BS, specific solutions may be required to fulfil the spurious emissions limits for BS for co-existence with UTRA Band XII or E-UTRA Band 12 or NR Band n12 UL operating band or E-UTRA Band 17 UL operating band or E-UTRA Band 85 UL operating band. | | | | | |

The following requirement may be applied for the protection of PHS. This requirement is also applicable at specified frequencies falling between ΔfOBUE below the lowest BS transmitter frequency of the downlink operating band and ΔfOBUE above the highest BS transmitter frequency of the downlink operating band.

The power of any spurious emission shall not exceed:

TABLE 3.6.4-2

BS spurious emissions limits for BS for co-existence with PHS

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum level | Measurement bandwidth | Note |
| 1 884.5‑1 915.7 MHz | −41 dBm | 300 kHz | Applicable for co-existence with PHS system operating in 1 84.5-1 915.7 MHz |
| NOTE – The requirement is not applicable in China. | | | |

The following requirement may apply to E-UTRA BS operating in Band 41 in certain regions. This requirement is also applicable at the frequency range from ΔfOBUE below the lowest frequency of the BS downlink operating band up to ΔfOBUE above the highest frequency of the BS downlink operating band.

For Band 41 NR operation, the additional BS spurious emissions limits shall be applied to the sum of the emission power over all *antenna connectors.*

The power of any spurious emission shall not exceed:

TABLE 3.6.4-3

Additional BS spurious emissions limits for BS operating in Band 41

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum level | Measurement bandwidth | Note |
| 2 505 MHz–2 535 MHz | −42 dBm | 1 MHz | – |
| NOTE – This requirement applies for 10 or 20 MHz E-UTRA carriers allocated within 2 545-2645 MHz. | | | |

In addition to the requirements in §§ 3.6.1 to 3.6.4 and above in the present subclause, the BS may have to comply with the applicable emission limits established by FCC Title 47, when deployed in regions where those limits are applied, and under the conditions declared by the manufacturer.

The following requirement may apply to BS operating in Band 30 in certain regions. This requirement is also applicable at the frequency range from 10 MHz below the lowest frequency of the BS downlink operating band up to 10 MHz above the highest frequency of the BS downlink operating band.

The power of any spurious emission shall not exceed:

TABLE 3.6.4-3

Additional BS spurious emissions limits for Band 30

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum level | Measurement bandwidth | Note |
| 2 200 MHz-2 345 MHz | –45 dBm | 1 MHz |  |
| 2 362.5 MHz-2 365 MHz | –25 dBm | 1 MHz |  |
| 2 365 MHz-2 367.5 MHz | –40 dBm | 1 MHz |  |
| 2 367.5 MHz-2 370 MHz | –42 dBm | 1 MHz |  |
| 2 370 MHz-2 39 5MHz | –45 dBm | 1 MHz |  |

In certain regions the following requirement may apply to E-UTRA BS operating in Band 45. Emissions shall not exceed the maximum levels specified in Table 3.6.4-4.

TABLE 3.6.4-4

Emissions limits for protection of adjacent band services

|  |  |  |  |
| --- | --- | --- | --- |
| Operating Band | Filter centre frequency, Ffilter | Maximum Level [dBm] | Measurement Bandwidth |
|  | Ffilter = 1467.5 | -20 | 1 MHz |
|  | Ffilter = 1468.5 | -23 | 1 MHz |
| 45 | Ffilter = 1469.5 | -26 | 1 MHz |
|  | Ffilter = 1470.5 | -33 | 1 MHz |
|  | Ffilter = 1471.5 | -40 | 1 MHz |
|  | 1472.5 MHz ≤ Ffilter ≤ 1491.5 MHz | -47 | 1 MHz |

The following requirement may apply to E-UTRA BS operating in Band 48 in certain regions. The power of any spurious emission shall not exceed:

TABLE 3.6.4-5

Additional BS Spurious emissions limits for Band 48

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum Level | Measurement Bandwidth | Note |
| 3530MHz – 3720MHz | -25dBm | 1 MHz | Applicable 10MHz from the assigned channel edge |
| 3100MHz – 3530MHz  3720MHz – 4200MHz | -40dBm | 1 MHz |  |

### 3.6.5 Co-location with other base stations

These requirements may be applied for the protection of other BS receivers when GSM900, DCS1800, PCS1900, GSM850, CDMA850, UTRA FDD, UTRA TDD, E-UTRA and/or NR BS are co‑located with a BS.

The requirements assume a 30 dB coupling loss between transmitter and receiver and are based on co-location with base stations of the same class.

The power of any spurious emission shall not exceed the limits of Table 3.6.5-1 for a BS where requirements for co-location with a BS type listed in the first column apply, depending on the declared BS class.

BS capable of multi-band operation, the exclusions and conditions in the Note column of Table 3.6.5‑1 apply for each supported operating band. For BS capable of multi-band operation where multiple bands are mapped on separate antenna connectors, the exclusions and conditions in the Note column of Table 3.6.5-1 apply for the operating band supported at that antenna connector.

TABLE 3.6.5-1

BS spurious emissions limits for BS co-located with another BS

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type of  co-located BS | Frequency range for co-location requirement | Maximum level (WA BS) | Maximum level (MR BS) | Maximum level (LA BS) | Measurement bandwidth | Note |
| GSM900 | 876-915 MHz | −98 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| DCS1800 | 1 710-1 785 MHz | −98 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| PCS1900 | 1 850-1 910 MHz | −98 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| GSM850 or CDMA850 | 824-849 MHz | −98 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band I or E-UTRA Band 1  or NR Band n1 | 1 920-1 980 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band II or E-UTRA Band 2  or NR Band n2 | 1 850-1 910 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band III or E-UTRA Band 3  or NR Band n3 | 1 710-1 785 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band IV or E-UTRA Band 4 | 1 710-1 755 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band V or E-UTRA Band 5  or NR Band n5 | 824-849 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band VI, XIX or E-UTRA Band 6, 19 | 830-845 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band VII or E-UTRA Band 7  or NR Band n7 | 2 500-2 570 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |

TABLE 3.6.5-1 (*continued*)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type of  co-located BS | Frequency range for co-location requirement | Maximum level (WA BS) | Maximum level (MR BS) | Maximum level (LA BS) | Measurement bandwidth | Note |
| UTRA FDD Band VIII or E-UTRA Band 8  or NR Band n8 | 880-915 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band IX or E-UTRA Band 9 | 1 749.9- 1 784.9 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band X or  E-UTRA Band 10 | 1 710-1 770 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band XI or  E-UTRA Band 11 | 1 427.9- 1 447.9 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 50, 51, 75 or 76 |
| UTRA FDD Band XII or  E-UTRA Band 12  or NR Band n12 | 699-716 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band XIII or  E-UTRA Band 13 | 777-787 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band XIV or  E-UTRA Band 14  or NR Band n14 | 788-798 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| E-UTRA Band 17 | 704-716 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| E-UTRA Band 18  or NR Band n18 | 815-830 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band XX or  E-UTRA Band 20  or NR Band n20 | 832-862 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band XXI or E-UTRA Band 21 | 1 447.9–1 462.9 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 32, 50 or 75 |
| UTRA FDD Band XXII or E-UTRA Band 22 | 3 410–3 490 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 42, 77 or 78. |
| E-UTRA Band 23 | 2 000-2 020 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| E-UTRA Band 24 | 1 626.5–1 660.5 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |

TABLE 3.6.5-1 (*continued*)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type of  co-located BS | Frequency range for co-location requirement | Maximum level (WA BS) | Maximum level (MR BS) | Maximum level (LA BS) | Measurement bandwidth | Note |
| UTRA FDD Band XXV or E-UTRA Band 25  or NR Band n25 | 1 850-1 915 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| UTRA FDD Band XXVI or E-UTRA Band 26  or NR Band n26 | 814-849 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| E-UTRA Band 27 | 807‑824 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | – |
| E-UTRA Band 28  or NR Band n28 | 703‑748 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 44 |
| E-UTRA Band 30  or NR Band n30 | 2 305-2 315 MHz | –96 dBm | –91 dBm | –88 dBm | 100 kHz | This is not applicable to BS operating in Band 40 |
| E-UTRA Band 31 | 452.5–457.5 MHz | –96 dBm | –91 dBm | –88 dBm | 100 kHz |  |
| UTRA TDD Band a) or E-UTRA Band 33 | 1 900-1 920 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 33 |
| UTRA TDD Band a) or  E-UTRA Band 34  or NR Band n34 | 2 010-2 025 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 34 |
| UTRA TDD Band b) or  E-UTRA Band 35 | 1 850–1 910 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 35 |
| UTRA TDD Band b) or  E-UTRA Band 36 | 1 930-1 990 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Bands 2 and 36 |
| UTRA TDD Band c) or  E-UTRA Band 37 | 1 910-1 930 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 37. This unpaired band is defined in Rec. ITU-R M.1036, but is pending any future deployment |
| UTRA TDD Band d) or  E-UTRA Band 38  or NR Band n38 | 2 570–2 620 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 38 |

TABLE 3.6.5-1 (*end*)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type of  co-located BS | Frequency range for co-location requirement | Maximum level (WA BS) | Maximum level (MR BS) | Maximum level (LA BS) | Measurement bandwidth | Note |
| UTRA TDD Band f) or  E-UTRA Band 39  or NR Band n39 | 1 880–1 920 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 33 and 39 |
| UTRA TDD Band e) or  E-UTRA Band 40  or NR Band n40 | 2 300–2 400 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 40 |
| E-UTRA Band 41  or NR Band n41 | 2 496–2 690 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 41 or 53. |
| E-UTRA Band 42 | 3 400–3 600 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 22, 42, 43, 48, 49, 52 77 or 78. |
| E-UTRA Band 43 | 3 600–3 800 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 42, 43, 48, 49, 77 or 78. |
| E-UTRA Band 44 | 703–803 MHz | −96 dBm | −91 dBm | −88 dBm | 100 kHz | This is not applicable to BS operating in Band 28 or 44 |
| E-UTRA Band 45 | 1447 – 1467 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 45 |
| E-UTRA Band 46 or NR Band n46 | 5150 – 5925 MHz | N/A | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 48 or NR Band n48 | 3550 – 3700 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 42, 43, 48, 49, 77 or 78. |
| E-UTRA Band 49 | 3550 – 3700 MHz | N/A | N/A | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 42, 43, 48, 49, 77 or 78. |
| E-UTRA Band 50 or NR Band n50 | 1432 – 1517 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 11, 21, 32, 51, 74, 75 or 76 |
| E-UTRA Band 51 or NR Band n51 | 1427 – 1432 MHz | N/A | N/A | -88 dBm | 100 kHz | This is not applicable to E-UTRA BS operating in Band 50, 75 or 76 |
| E-UTRA Band 52 | 3300 – 3400 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 42 or 52. |
| E-UTRA Band 53 or NR Band n53 | 2483.5 – 2495 MHz | N/A | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 41 or 53 |
| E-UTRA Band 65 or NR Band n65 | 1920 - 2010 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 66 or NR Band n66 | 1710 – 1780 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 68 | 698 – 728 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 70 or NR Band n70 | 1695 – 1710 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 71 or NR Band 71 | 663 – 698 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 72 | 451 – 456 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 73 | 450 – 455 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 74 or NR Band n74 | 1427 – 1470 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 50 or 51. |
| NR Band n77 | 3300 MHz – 4200 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 22, 42, 43, 48, 49, 52, 77 or 78. |
| NR Band n78 | 3300 MHz – 3800 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 22, 42, 43, 48, 49, 52, 77 or 78. |
| NR Band n79 | 4.4 – 5.0 GHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| NR Band n80 | 1710 – 1785 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| NR Band n81 | 880 – 915 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| NR Band n82 | 832 – 862 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| NR Band n83 | 703 – 748 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 44 |
| NR Band n84 | 1920 – 1980 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 85 | 698 - 716 MHz | -96 dBm | -91 dBm | -91 dBm | 100 kHz |  |
| NR Band n86 | 1710 – 1780 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 87 | 410 - 415 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 88 | 412 - 417 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| NR Band n89 | 824 - 849 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| NR Band n91 | 832 – 862 MHz | N/A | N/A | -88 dBm | 100 kHz |  |
| NR Band n92 | 832 – 862 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| NR Band n93 | 880 – 915 MHz | N/A | N/A | -88 dBm | 100 kHz |  |
| NR Band n94 | 880 – 915 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| NR Band n95 | 2010 - 2025 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| NR Band n96 | 5925 - 7125 MHz | N/A | -90dBm | -87 dBm | 100 kHz |  |
| NOTE 1 – As defined in the scope for spurious emissions in this subclause, the co-location requirements in Table 3.6.5‑1 do not apply for the ΔfOBUE frequency range immediately outside the BS transmit frequency range of a downlink operating band. The current state-of-the-art technology does not allow a single generic solution for co-location with other system on adjacent frequencies for 30 dB BS-BS minimum coupling loss. However, there are certain site-engineering solutions that can be used. These techniques are addressed in 3GPP TR 25.942.  NOTE 2 – Table 3.6.5-1 assumes that two operating bands, where the corresponding BS transmit and receive frequency ranges would be overlapping, are not deployed in the same geographical area. For such a case of operation with overlapping frequency arrangements in the same geographical area, special co-location requirements may apply that are not covered by these specifications.  NOTE 3 – Co-located TDD Base Stations that are synchronized and using the same or adjacent operating band can transmit without special co-locations requirements. For unsynchronized base stations, special co-location requirements may apply that are not covered by these specifications. | | | | | | |

## 3.7 Receiver spurious emissions

For TDD BS with common RX and TX antenna port the requirement applies during the Transmitter OFF period. For FDD BS with common RX and TX antenna port the transmitter spurious emission limits as specified in § 3.6.1 are valid.

Unless otherwise stated, a BS declared to be capable of E-UTRA with NB-IoT in-band and guard band operations (or any combination with GSM and/or UTRA) is only required to pass the receiver spurious emissions tests for E-UTRA with guard band operation (or any combination with GSM and/or UTRA). It’s not required to perform the receiver spurious emissions tests again for E-UTRA with in-band operation (or any combination with GSM and/or UTRA).

The power of any spurious emission shall not exceed the levels in Table 3.7-1.

TABLE 3.7-1

General spurious emission test requirement

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum level | Measurement Bandwidth | Note |
| 30 MHz – 1 GHz | −57 dBm | 100 kHz |  |
| 1 GHz – 12.75 GHz | −47 dBm | 1 MHz |  |
| 12.75 GHz – 5th harmonic of the upper frequency edge of the UL operating band in GHz | −47 dBm | 1 MHz | This spurious frequency range applies only for *operating bands* for which the 5th harmonic of the upper frequency edge of the UL *operating band* is reaching beyond 12.75 GHz. |
| NOTE – The frequency range from *FBW RF,DL,low* - ΔfOBUE to *FBW RF,\_,DLhigh* + ΔfOBUE may be excluded from the requirement. For BS capable of multi-band operation, the exclusion applies for all supported operating bands. For BS capable of multi-band operation where multiple bands are mapped on separate antenna connectors, the single-band requirements apply and the excluded frequency range is only applicable for the operating band supported on each antenna connector. | | | |

In addition to the requirements in Table 3.7-1, the power of any spurious emission shall not exceed the additional spurious emissions requirements in §§ 3.6.1 to 3.6.4. In addition, the requirements for co-location with other base stations specified in § 3.6.5 may also be applied.

Attachment 1   
to Annex 1  
  
Definition of test tolerance

Test tolerance

With reference to Recommendation ITU-R M.1545, “test tolerance” is the relaxation value referred to in *recommends* 2 of Recommendation ITU-R M.1545, i.e. the difference between the core specification value and the test limit, evaluated applying the shared risk principle as per Figs 2 and 3 of Annex 1 of Recommendation ITU-R M.1545. In case the core specification value is equal to the test limit (Fig. 3 of Annex 1 of Recommendation ITU-R M.1545) the “test tolerances” are equal to 0.

#### < End OF CHANGE>