**3GPP TSG-WG RAN4 Meeting #96-e *R4-2012766***

**Electronic meeting, 17th – 28th August, 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **37.104** | **CR** | **0906** | **rev** | **1** | **Current version:** | **16.6.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network |  |

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| ***Title:***  | CR to 37.104: Introduction of NR-U co-existence requirements |
|  |  |
| ***Source to WG:*** |  Nokia, Nokia Shanghai Bell, Qualcomm, Charter, AT&T, Verizon |
| ***Source to TSG:*** |  R4 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** | 2020-08-27 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-16 |
|  | *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 canbe 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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | Introduction on NR-U co-existence requirements. |
|  |  |
| ***Summary of change:*** | Relevant sections updated to introduce NR-U co-existence requirements. |
|  |  |
| ***Consequences if not approved:*** | NR-U co-existence requirements would be missing. |
|  |  |
| ***Clauses affected:*** | 6.6.1.3.1, 6.6.1.4.1, 7.5.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS 37.141 |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

##### 6.6.1.3.1 Minimum Requirement

The power of any spurious emission shall not exceed the limits of Table 6.6.1.3.1-1 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 6.6.1.3.1-1 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 6.6.1.3.1-1 apply for the operating band supported at that antenna connector.

Table 6.6.1.3.1-1: BS Spurious emissions limits for co-existence with systems operating in other frequency bands

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| --- | --- | --- | --- | --- |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| DCS1800 (Note 3) | 1805 ‑ 1880 MHz | -47 dBm | 100 kHz | This requirement does not apply to BS operating in band 3.  |
| 1710 - 1785 MHz | -61 dBm | 100 kHz | This requirement does not apply to BS operating in band 3, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| PCS1900 | 1930 ‑ 1990 MHz | -47 dBm | 100 kHz | This requirement does not apply to BS operating in band 2, 25, 36, 70. |
| 1850 ‑ 1910 MHz | -61 dBm | 100 kHz | This requirement does not apply to BS operating in band 2 or 25, since it is already covered by the requirement in sub-clause 6.6.1.2. This requirement does not apply to BS operating in band 35. |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. 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 | 2110 - 2170 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 1 or 65,  |
| 1920 - 1980 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 1 or 65, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| UTRA FDD Band II or E-UTRA Band 2 or NR Band n2 | 1930 - 1990 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 2, 25, 70. |
| 1850 - 1910 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 2 or 25, since it is already covered by the requirement in sub-clause 6.6.1.2 |
| UTRA FDD Band III or E-UTRA Band 3 or NR Band n3(Note 3) | 1805 - 1880 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 3 or 9. |
| 1710 - 1785 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 3, since it is already covered by the requirement in sub-clause 6.6.1.2. For BS operating in band 9, it applies for 1710 MHz to 1749.9 MHz and 1784.9 MHz to 1785 MHz, while the rest is covered in sub-clause 6.6.1.2. |
| UTRA FDD Band IV or E-UTRA Band 4 | 2110 - 2155 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 4, 10 or 66 |
| 1710 - 1755 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 4, 10 or 66, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. For BS operating in Band 27, it applies 3 MHz below the Band 27 downlink operating band. |
| UTRA FDD Band VI, XIX or E-UTRA Band 6, 18, 19 or NR Band n18 | 860 - 890 MHz  | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 6, 18, 19 |
| 815 - 830 MHz  | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 18 since it is already covered by the requirement in sub-clause 6.6.1.2. |
| 830 - 845 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 6, 19, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| UTRA FDD Band VII or E-UTRA Band 7 or NR Band n7 | 2620 - 2690 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 7. |
| 2500 - 2570 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 7, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| UTRA FDD Band IX or E-UTRA Band 9 | 1844.9 - 1879.9 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 3 or 9. |
| 1749.9 - 1784.9 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 3 or 9, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| UTRA FDD Band X or E-UTRA Band 10 | 2110 - 2170 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 4, 10, 66 |
| 1710 - 1770 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 10, 66, since it is already covered by the requirement in sub-clause 6.6.1.2. For BS operating in Band 4, it applies for 1755 MHz to 1770 MHz, while the rest is covered in sub-clause 6.6.1.2. |
| UTRA FDD Band XI or XXI or E-UTRA Band 11 or 21 | 1475.9 - 1510.9 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 11, 21, 32, 50, 74, 75 |
| 1427.9 - 1447.9 MHz  | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 11 or 74, since it is already covered by the requirement in sub-clause 6.6.1.2. This requirement does not apply to BS operating in band 32, 50, 51, 75, 76. |
| 1447.9 – 1462.9 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 21 or 74, since it is already covered by the requirement in sub-clause 6.6.1.2. This requirement does not apply to BS operating in band 32, 50, 75 or n75. |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. 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, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| 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, since it is already covered by the requirement in subclause 6.6.1.2. 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, 28. |
| 832 - 862 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 20, since it is already covered by the requirement in subclause 6.6.1.2. |
| UTRA FDD Band XXII or E-UTRA Band 22 | 3510 – 3590 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 22, 42, 48, 49, 77 or 78. |
| 3410 – 3490 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 22, since it is already covered by the requirement in subclause 6.6.1.2. This requirement does not apply to Band 42. |
| E-UTRA Band 24 | 1525 – 1559 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 24. |
| 1626.5 – 1660.5 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 24, since it is already covered by the requirement in subclause 6.6.1.2. |
| UTRA FDD Band XXV or E-UTRA Band 25 or NR Band n25 | 1930 - 1995 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 2, 25, 70.  |
| 1850 - 1915 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 25, since it is already covered by the requirement in sub-clause 6.6.1.2. For BS operating in Band 2, it applies for 1910 MHz to 1915 MHz, while the rest is covered in sub-clause 6.6.1.2. |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. For BS operating in Band 5, it applies for 814 MHz to 824 MHz, while the rest is covered in sub-clause 6.6.1.2. 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, since it is already covered by the requirement in subclause 6.6.1.2. For BS operating in Band 26, it applies for 807 MHz to 814 MHz, while the rest is covered in sub-clause 6.6.1.2. 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, 67 or 68. |
| 703 - 748 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 28, since it is already covered by the requirement in sub-clause 6.6.1.2. 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 | 2350 - 2360 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 30 or 40. |
| 2305 - 2315 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 30, since it is already covered by the requirement in sub-clause 6.6.1.2. 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, since it is already covered by the requirement in sub-clause 6.6.1.2. This requirement does not apply to BS operating in band 72 or 73. |
| UTRA FDD Band XXXII or E-UTRA Band 32 | 1452 - 1496 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in band 11, 21, 32, 50, 74, 75. |
| UTRA TDD Band a) or E-UTRA Band 33 | 1900 - 1920 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 | 2010 - 2025 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 | 1850 – 1910 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 35 |
| UTRA TDD Band b) or E-UTRA Band 36 | 1930 - 1990 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 2, 25 or 36 |
| UTRA TDD Band c) or E-UTRA Band 37 | 1910 - 1930 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 | 2570 – 2620 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 | 1880 – 1920MHz | -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 | 2300 – 2400MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band 30 or 40 |
| E-UTRA Band 41 or NR Band n41 | 2496 – 2690MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band 41 or 53 |
| E-UTRA Band 42 | 3400 – 3600 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 | 3600 – 3800 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 | This is not applicable to BS operating in Band 46, n46 or n96. |
| 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 BS operating in Band 11, 21, 32, 45, 50, 51, 74, 75, 76. |
| E-UTRA Band 51 or NR Band n51 | 1427 - 1432 MHz | -52 dBm | 1 MHz | This requirement does not apply to BS operating in Band 50, 51, 75, 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, since it is already covered by the requirement in sub-clause 6.6.1.2.For BS operating in Band 1, it applies for 1980 MHz to 2010 MHz, while the rest is covered in sub-clause 6.6.1.2. |
| 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, 66. |
| 1710 - 1780 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 66, since it is already covered by the requirement in sub-clause 6.6.1.2. For BS operating in Band 4, it applies for 1755 MHz to 1780 MHz, while the rest is covered in sub-clause 6.6.1.2. For BS operating in Band 10, it applies for 1770 MHz to 1780 MHz, while the rest is covered in sub-clause 6.6.1.2. |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. For BS operating in Band 28, it applies between 698 MHz and 703 MHz, while the rest is covered in sub-clause 6.6.1.2. |
| 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, 70 |
| 1695 – 1710 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 70, since it is already covered by the requirement in sub-clause 6.6.1.2 |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2 |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. 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, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| 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, 75. |
| 1427 – 1470 MHz | -49 dBm | 1MHz | This requirement does not apply to BS operating in Band 74 or n74, since it is already covered by the requirement in sub-clause 6.6.1.2. This requirement does not apply to BS operating in band 32, 45, 50, 51, 75, 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, 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, 76. |
| NR Band n77 | 3300 MHz – 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 MHz – 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 n80 | 1710 - 1785 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 3, since it is already covered by the requirement in sub-clause 6.6.1.2. For BS operating in band 9, it applies for 1710 MHz to 1749.9 MHz and 1784.9 MHz to 1785 MHz, while the rest is covered in sub-clause 6.6.1.2. |
| NR Band n81 | 880 - 915 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 8, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| NR Band n82 | 832 - 862 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 20, since it is already covered by the requirement in subclause 6.6.1.2. |
| NR Band n83 | 703 - 748 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 28, since it is already covered by the requirement in sub-clause 6.6.1.2. 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. |
| NR Band n84 | 1920 - 1980 MHz | -49 dBm | 1 MHz | This requirement does not apply to BS operating in band 1 or 65, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. 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, since it is already covered by the requirement in sub-clause 6.6.1.2. For BS operating in Band 4, it applies for 1755 MHz to 1780 MHz, while the rest is covered in sub-clause 6.6.1.2. For BS operating in Band 10, it applies for 1770 MHz to 1780 MHz, while the rest is covered in sub-clause 6.6.1.2. |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2 |
| 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, since it is already covered by the requirement in sub-clause 6.6.1.2. 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, since it is already covered by the requirement in sub-clause 6.6.1.2. 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, 76. |
| 832 – 862 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 20, since it is already covered by the requirement in subclause 6.6.1.2. |
| 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, 76. |
| 832 – 862 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 20, since it is already covered by the requirement in subclause 6.6.1.2. |
| 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, 76. |
| 880 – 915 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 8, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| 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, 76. |
| 880 – 915 MHz | -49 dBm | 1 MHz | This requirement does not apply to E-UTRA BS operating in band 8, since it is already covered by the requirement in sub-clause 6.6.1.2. |
| NR Band n95 | 2010 - 2025 MHz | -52 dBm | 1 MHz |  |
| NR Band n96 | 5925 - 7125 MHz | -52 dBm | 1 MHz | This is not applicable to BS operating in Band n46 or n96. |
| NOTE 5: Void |

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 6.6.1.3.1-1 do not apply for the 10 MHz frequency range immediately outside the downlink operating band (see Tables 4.5-1 and 4.5-2). Emission limits for this excluded frequency range may be covered by local or regional requirements.

NOTE 2: Table 6.6.1.3.1-1 assumes that two operating bands, where the frequency ranges in Table 4.5-1 or Table 4.5-2 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 the 3GPP specifications.

NOTE 3: For the protection of DCS1800, UTRA Band III, E-UTRA Band 3 or NR Band n3 in China, the frequency ranges of the downlink and uplink protection requirements are 1805 – 1850 MHz and 1710 – 1755 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 base stations (except in Band 46), special co-existence requirements may apply that are not covered by the 3GPP specifications.

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 6.6.1.3.1-2: BS Spurious emissions limits for BS for co-existence with PHS

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum Level | Measurement Bandwidth | Note |
| 1884.5 ‑ 1915.7 MHz | -41 dBm | 300 kHz | Applicable for co-existence with PHS system operating in 1884.5-1915.7 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 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 6.6.1.3.1-3: Additional BS Spurious emissions limits for Band 41

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum Level | Measurement Bandwidth | Note |
| 2505MHz – 2535MHz | -42dBm | 1 MHz |  |
| 2535MHz – 2655MHz | -22dBm | 1 MHz | Applicable at offsets ≥ 250% of channel bandwidth from carrier frequency |
|  |  |  |  |
| NOTE: This requirement applies for 10 or 20 MHz E-UTRA carriers allocated within 2545-2575MHz or 2595-2645MHz. |

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 6.6.1.3.1-4: Additional BS Spurious emissions limits for Band 30

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency range | Maximum Level | Measurement Bandwidth | Note |
| 2200MHz – 2345MHz | -45dBm | 1 MHz |  |
| 2362.5MHz – 2365MHz | -25dBm | 1 MHz |  |
| 2365MHz – 2367.5MHz | -40dBm | 1 MHz |  |
| 2367.5MHz – 2370MHz | -42dBm | 1 MHz |  |
| 2370MHz – 2395MHz | -45dBm | 1 MHz |  |

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

Table 6.6.1.3.1-5: 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 – 3530MHz3720MHz – 4200MHz | -40dBm | 1 MHz |  |

In addition to the requirements in subclauses 6.6.1.1, 6.6.1.2 and above in the present subclause, the BS may have to comply with the applicable emission limits established by FCC Title 47 [8], when deployed in regions where those limits are applied, and under the conditions declared by the manufacturer.

#### 6.6.1.4 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, NB-IoT 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.

NOTE: For co-location with UTRA, the requirements are based on co-location with UTRA FDD or TDD base stations.

##### 6.6.1.4.1 Minimum Requirement

The power of any spurious emission shall not exceed the limits of Table 6.6.1.4.1-1 for a BS where requirements for co-location with a BS type listed in the first column apply, depending on the declared Base Station class. For BS capable of multi-band operation, the exclusions and conditions in the Note column of Table 6.6.1.4.1-1 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 6.6.1.4.1-1 apply for the operating band supported at that antenna connector.

Table 6.6.1.4.1-1: 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 | 1710 - 1785 MHz | -98 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| PCS1900 | 1850 - 1910 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 | 1920 - 1980 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| UTRA FDD Band II or E-UTRA Band 2 or NR Band n2 | 1850 - 1910 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| UTRA FDD Band III or E-UTRA Band 3 or NR Band n3 | 1710 - 1785 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| UTRA FDD Band IV or E-UTRA Band 4 | 1710 - 1755 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 | 2500 - 2570 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| 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 | 1749.9 - 1784.9 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| UTRA FDD Band X or E-UTRA Band 10 | 1710 - 1770 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| UTRA FDD Band XI or E-UTRA Band 11 | 1427.9 - 1447.9 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 50, 51, 75, 76 |
| UTRA FDD Band XII orE-UTRA Band 12 or NR Band n12 | 699 - 716 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| UTRA FDD Band XIII orE-UTRA Band 13 | 777 - 787 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| UTRA FDD Band XIV orE-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 orE-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 | 1447.9 – 1462.9 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 32, 50, 75 |
| UTRA FDD Band XXII or E-UTRA Band 22 | 3410 – 3490 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 | 2000 - 2020 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| E-UTRA Band 24 | 1626.5 – 1660.5 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz |  |
| UTRA FDD Band XXV or E-UTRA Band 25 or NR Band n25 | 1850 - 1915 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 | 2305 - 2315 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 | 1900 - 1920 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 | 2010 - 2025 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 | 1850 – 1910 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 | 1930 - 1990 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 2, n2 and 36 |
| UTRA TDD Band c) or E-UTRA Band 37 | 1910 - 1930 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 ITU-R M.1036, but is pending any future deployment. |
| UTRA TDD Band d) or E-UTRA Band 38 or NR Band n38 | 2570 – 2620 MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 38. |
| UTRA TDD Band f) or E-UTRA Band 39 or NR Band n39 | 1880 – 1920MHz | -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 | 2300 – 2400MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 30 or 40 |
| E-UTRA Band 41 or NR Band n41 | 2496 – 2690MHz | -96 dBm | -91 dBm | -88 dBm | 100 kHz | This is not applicable to BS operating in Band 41 or 53 |
| E-UTRA Band 42 | 3400 – 3600 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 | 3600 – 3800 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 | This is not applicable to BS operating in Band 46 |
| 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, n51, 74, 75, 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 BS operating in Band 50, 75, 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 n71 | 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, 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 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 | -88 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 | N/A | -87 dBm | 100 kHz |  |

------------------------------------------------------------- NEXT CHANGE ------------------------------------------------------

### 7.5.2 Co-location minimum requirement

This additional blocking requirement may be applied for the protection of BS receivers when NR, E-UTRA, NB-IoT, UTRA, CDMA or GSM/EDGE BS operating in a different frequency band are co-located with a BS.

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

For a wanted and an interfering signal coupled to BS antenna input using the parameters in Table 7.5.2-1, the following requirements shall be met:

- For any E-UTRA carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 36.104 [4], subclause 7.2.

- For any UTRA FDD carrier, the BER shall not exceed 0.001 for the reference measurement channel defined in TS 25.104 [2], subclause 7.2.

- For any UTRA TDD carrier, the BER shall not exceed 0.001 for the reference measurement channel defined in TS 25.105 [3], subclause 7.2.

- For any GSM/EDGE carrier, the conditions are specified in TS 45.005 [5], Annex P.2.1.

- For any NB-IoT carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 36.104 [4], subclause 7.2.

- For any NR carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 38.104 [17], subclause 7.2.

Table 7.5.2-1: Blocking requirement for co-location with BS in other frequency bands.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type of co-located BS | Centre Frequency of Interfering Signal (MHz) | Interfering Signal mean power for WA BS (dBm) | Interfering Signal mean power for MR BS (dBm) | Interfering Signal mean power for LA BS (dBm) | Wanted Signal mean power (dBm) | Type of Interfering Signal |
| GSM850 or CDMA850 | 869 – 894 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| GSM900 | 921 – 960 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| DCS1800 | 1805 – 1880(Note 4) | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| PCS1900 | 1930 – 1990 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band I or E-UTRA Band 1 or NR Band n1 | 2110 – 2170 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band II or E-UTRA Band 2 or NR Band n2 | 1930 – 1990 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band III or E-UTRA Band 3 or NR Band n3 | 1805 – 1880(Note 4) | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band IV or E-UTRA Band 4 | 2110 – 2155 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band V or E-UTRA Band 5 or NR Band n5 | 869 – 894 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band VI or E-UTRA Band 6 | 875 – 885 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band VII or E-UTRA Band 7 or NR Band n7 | 2620 – 2690 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band VIII or E-UTRA Band 8 or NR Band n8 | 925 – 960 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band IX or E-UTRA Band 9 | 1844.9 – 1879.9 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band X or E-UTRA Band 10 | 2110 – 2170 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XI or E-UTRA Band 11 | 1475.9 - 1495.9 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XII or E-UTRA Band 12 or NR Band n12 | 729 - 746 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XIIII or E-UTRA Band 13 | 746 - 756 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XIV or E-UTRA Band 14 or NR Band n14 | 758 - 768 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 17 | 734 - 746 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 18 or NR Band n18 | 860 - 875 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XIX or E-UTRA Band 19 | 875 - 890 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XX or E-UTRA Band 20 or NR Band n20 | 791 - 821 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XXI or E-UTRA Band 21 | 1495.9 – 1510.9 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XXII or E-UTRA Band 22 | 3510 – 3590 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 23 | 2180 - 2200 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 24 | 1525 – 1559 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XXV or E-UTRA Band 25 or NR Band n25 | 1930 – 1995 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA FDD Band XXVI or E-UTRA Band 26 or NR Band n26 | 859 – 894 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 27 | 852 - 869 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 28 or NR Band n28 | 758 – 803 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 29 or NR Band n29 | 717 – 728 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + 6dB\* | CW carrier |
| E-UTRA Band 30 or NR Band n30 | 2350-2360 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 31 | 462.5 – 467.5 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + 6dB\* | CW carrier |
| UTRA FDD Band XXXII or E-UTRA Band 32 | 1452 – 1496(NOTE 5) | +16\*\* | +8\*\* | -6\*\* | PREFSENS + 6dB\* | CW carrier |
| UTRA TDD Band a) or E-UTRA TDD Band 33 | 1900-1920 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA TDD Band a) or E-UTRA TDD Band 34 or NR Band n34 | 2010-2025 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA TDD Band b) or E-UTRA TDD Band 35 | 1850-1910 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA TDD Band b) or E-UTRA TDD Band 36 | 1930-1990 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA TDD Band c) or E-UTRA TDD Band 37 | 1910-1930 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA TDD Band d) or E-UTRA Band 38 or NR Band n38 | 2570-2620 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA TDD Band f) or E-UTRA Band 39 or NR Band n39 | 1880-1920 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| UTRA TDD Band e) or E-UTRA Band 40 or NR Band n40 | 2300-2400 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 41 or NR Band n41 | 2496 - 2690 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 42 | 3400 – 3600 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 43 | 3600 – 3800 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 44 | 703 - 803 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 45 | 1447 - 1467 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 46 or NR Band n46 | 5150 - 5925 | N/A | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 48 or NR Band n48 | 3550 – 3700 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 49 | 3550 – 3700 | N/A | N/A | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 50 or NR Band n50 | 1432 – 1517 | +16 | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 51 or NR Band n51 | 1427– 1432 | N/A | N/A | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 52 | 3300 – 3400 | +16\*\* | +8 | -6 | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 53 or NR Band n53 | 2483.5 – 2495 | N/A | +8 | -6 | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 65 or NR Band n65 | 2110 – 2200 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 66 or NR Band n66 | 2110 – 2200 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 67 | 738 - 758 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 68 | 753 - 783 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 69  | 2570-2620 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 70 or NR Band n70 | 1995 - 2020 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 71 or NR Band n71 | 617 - 652 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 72 | 461 - 466 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + 6dB\* | CW carrier |
| E-UTRA Band 73 | 460 - 465 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + 6dB\* | CW carrier |
| E-UTRA Band 74 or NR band n74 | 1475 - 1518 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 75 or NR Band n75 | 1432 - 1517 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 76 or NR Band n76 | 1427 - 1432 | N/A | N/A | -6\*\* | PREFSENS + x dB\* | CW carrier |
| NR Band n77 | 3300 - 4200 | +16\*\* | +8 | -6 | PREFSENS + x dB\* | CW carrier |
| NR Band n78 | 3300 - 3800 | +16\*\* | +8 | -6 | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 85 | 728 - 746 | +16\*\* | +8 | -6 | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 87 | 420 – 425  | +16\*\* | +8 | -6 | PREFSENS + x dB\* | CW carrier |
| E-UTRA Band 88 | 422 – 427  | +16\*\* | +8 | -6 | PREFSENS + x dB\* | CW carrier |
| NR Band n91 | 1427 – 1432 | N/A | N/A | -6\*\* | PREFSENS + x dB\* | CW carrier |
| NR Band n92 | 1432 – 1517 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| NR Band n93 | 1427 – 1432 | N/A | N/A | -6\*\* | PREFSENS + x dB\* | CW carrier |
| NR Band n94 | 1432 – 1517 | +16\*\* | +8\*\* | -6\*\* | PREFSENS + x dB\* | CW carrier |
| NR Band n96 | 5925 – 7125 | N/A | N/A | -6\*\* | PREFSENS + x dB\* | CW carrier |
| NOTE 1 (\*): PREFSENS depends on the RAT, the BS class and the channel bandwidth, see subclause 7.2.  "x" is equal to 3 in case of GSM/EDGE wanted signal and equal to 6 in case of NR or UTRA or E-UTRA or NB-IoT wanted signals.NOTE 2: Except for a BS operating in Band 13, these requirements do not apply when the interfering signal falls within any of the supported uplink operating band or in the ΔfOOB immediately outside any of the supported uplink operating band.For a BS operating in band 13 the requirements do not apply when the interfering signal falls within the frequency range 768-797 MHz.NOTE 3: Some combinations of bands may not be possible to co-site based on the requirements above. The current state-of-the-art technology does not allow a single generic solution for co-location of UTRA TDD or E-UTRA TDD or NR TDD with E-UTRA FDD or NR FDD on adjacent frequencies for 30dB BS-BS minimum coupling loss. However, there are certain site-engineering solutions that can be used. These techniques are addressed in TR 25.942 [7].NOTE 4: In China, the blocking requirement for co-location with DCS1800 and Band III BS is only applicable in the frequency range 1805-1850MHz.NOTE 5: For a BS operating in band 11, 21, 74, the requirement for co-location with Band 32 applies for interfering signal within the frequency range 1475.9-1495.9 MHz.NOTE 6: Co-located TDD base stations that are synchronized and using the same or adjacent operating band can receive without special co-location requirements. For unsynchronized base stations, special co-location requirements may apply that are not covered by the 3GPP specifications.NOTE 7 (\*\*): For NB-IoT, up to 24 exceptions are allowed for spurious response frequencies in each wanted signal frequency when measured using a 1MHz step size. For these exceptions the above throughput requirement shall be met when the blocking signal is set to a level of -40 dBm for 15 kHz subcarrier spacing and -46 dBm for 3.75 kHz subcarrier spacing. In addition, each group of exceptions shall not exceed three contiguous measurements using a 1MHz step size. |