



Recommendation ITU-R M.1580-5
(02/2014)

**Generic unwanted emission characteristics
of base stations using the terrestrial radio
interfaces of IMT-2000**

M Series
**Mobile, radiodetermination, amateur
and related satellite services**

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Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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RECOMMENDATION ITU-R M.1580-5*

Generic unwanted emission characteristics of base stations using the terrestrial radio interfaces of IMT-2000

(Question ITU-R 229-2/5)

(2002-2005-2007-2009-2012-2014)

Scope

This Recommendation provides the generic unwanted emission characteristics of base stations using the terrestrial radio interfaces of IMT-2000. Implementation of characteristics of base stations using the terrestrial radio interfaces of IMT-2000 in any of the bands included in this Recommendation is subject to compliance with the Radio Regulations.

The ITU Radiocommunication Assembly,

considering

- a) that unwanted emissions consist of both spurious and out-of-band (OoB) emissions according to No. **1.146** of the Radio Regulations (RR) and that spurious and OoB emissions are defined in RR Nos. **1.145** and **1.144**, respectively;
- b) that limitation of the maximum permitted levels of unwanted emissions of IMT-2000 base stations (BS) is necessary to protect other radio systems and services from interference and to enable coexistence between different technologies;
- c) that too stringent limits may lead to an increase in complexity of IMT-2000 BS;
- d) that every effort should be made to keep limits for unwanted emissions at the lowest possible values taking account of economic factors and technological limitations;
- e) that Recommendation ITU-R SM.329 relates to the effects, measurements and limits to be applied to spurious domain emissions;
- f) that the same spurious emission limits apply equally to BS of all radio interfaces;
- g) that Recommendation ITU-R SM.1541 relating to OoB emission specifies generic limits in the OoB domain which generally constitute the least restrictive OoB emission limits and encourages the development of more specific limits for each system;
- h) that the levels of spurious emissions of IMT-2000 BS shall comply with the limits specified in RR Appendix **3**;
- i) that the harmonization of unwanted emission limits will facilitate global use and access to a global market; however national/regional variations in unwanted emission limits may exist;
- j) that unwanted emission limits are dependent on the transmitter emission characteristics, ITU spurious emission limits and national standards and regulations in addition to depending on services operating in other bands;
- k) that the technology used by a system and its conformance with the recommended specifications and standards in Recommendation ITU-R M.1457 defines that system as IMT-2000 regardless of the frequency band of operation;

* This Recommendation should be brought to the attention of Radiocommunication Study Group 1.

l) that harmonized frequency arrangements for the bands identified for IMT are addressed in Recommendation ITU-R M.1036, which also indicates that some administrations may deploy IMT-2000 systems in bands other than those identified in the RR,

noting

- a) the work carried out by standardization bodies to define limits to protect other radio systems and services from interference and to enable coexistence between different technologies;
- b) that IMT-2000 base stations must comply with local, regional, and international regulations for out-of-band and spurious emissions relevant to their operations, wherever such regulations apply;
- c) that the notes and annexes of this Recommendation – being based on the ongoing work in standardization bodies – in order to reflect the wide applicability of IMT-2000 technologies and to maintain consistency with the technology specifications, may contain material which reflects information related to the technology applications in bands other than those identified for IMT,

recommends

that the unwanted emission characteristics of IMT-2000 base stations should be based on the limits contained in the technology specific Annexes 1 to 6 which correspond to the radio interface specifications described in §§ 5.1 to 5.6 of Recommendation ITU-R M.1457.

NOTE 1 – Except the cases stated in Notes 2, 3, 4 and 5, the unwanted emission limits are defined for BS operating according to the following arrangement: frequency division duplex (FDD) uplink in the band 1 920-1 980 MHz, FDD downlink in the band 2 110-2 170 MHz and time division duplex (TDD) in the band 1 885-1 980 MHz and 2 010-2 025 MHz. Future versions of this Recommendation will include limits applicable to other frequency bands. Subject to further study, it is anticipated that such limits would be similar to those already contained in this Recommendation.

NOTE 2 – The unwanted emission limits defined in Annex 1 are for BS operating at least one of the following arrangements:

- FDD uplink in the band 1 920-1 980 MHz, FDD downlink in the band 2 110-2 170 MHz, in Annex 1 referred to as FDD Band I in UTRA or Band 1 in E-UTRA.
- FDD uplink in the band 1 850-1 910 MHz, FDD downlink in the band 1 930-1 990 MHz, in Annex 1 referred to as FDD Band II in UTRA or Band 2 in E-UTRA.
- FDD uplink in the band 1 710-1 785 MHz, FDD downlink in the band 1 805-1 880 MHz, in Annex 1 referred to as FDD Band III in UTRA or Band 3 in E-UTRA.
- FDD uplink in the band 1 710-1 755 MHz, FDD downlink in the band 2 110-2 155 MHz, in Annex 1 referred to as FDD Band IV in UTRA or Band 4 in E-UTRA.
- FDD uplink in the band 824- 849 MHz, FDD downlink in the band 869-894 MHz, in Annex 1 referred to as FDD Band V in UTRA or Band 5 in E-UTRA.
- FDD uplink in the band 830- 840 MHz, FDD downlink in the band 875-885 MHz, in Annex 1 referred to as FDD Band VI in UTRA or Band 6 in E-UTRA.
- FDD uplink in the band 2 500-2 570 MHz, FDD downlink in the band 2 620-2 690 MHz, in Annex 1 referred to as FDD Band VII in UTRA or Band 7 in E-UTRA.
- FDD uplink in the band 880-915 MHz, FDD downlink in the band 925-960 MHz, in Annex 1 referred to as FDD Band VIII in UTRA or Band 8 in E-UTRA.
- FDD uplink in the band 1 749.9-1 784.9 MHz, FDD downlink in the band 1 844.9-1 879.9 MHz, in Annex 1 referred to as FDD Band IX in UTRA or Band 9 in E-UTRA.
- FDD uplink in the band 1 710-1 770 MHz, FDD downlink in the band 2 110-2 170 MHz, in Annex 1 referred to as FDD Band X in UTRA or Band 10 in E-UTRA.

- FDD uplink in the band 1 427.9-1 447.9 MHz[#], FDD downlink in the band 1 475.9-1 495.9 MHz[#], in Annex 1 referred to as FDD Band XI in UTRA or Band 11 in E-UTRA.
- FDD uplink in the band 699-716 MHz, FDD downlink in the band 729-746 MHz, in Annex 1 referred to as FDD Band XII in UTRA or Band 12 in E-UTRA.
- FDD uplink in the band 777-787 MHz, FDD downlink in the band 746-756 MHz, in Annex 1 referred to as FDD Band XIII in UTRA or Band 13 in E-UTRA.
- FDD uplink in the band 788-798 MHz, FDD downlink in the band 758-768 MHz, in Annex 1 referred to as FDD Band XIV in UTRA or Band 14 in E-UTRA.
- FDD uplink in the band 704-716 MHz, FDD downlink in the band 734-746 MHz, in Annex 1 referred to as FDD Band 17 in E-UTRA.
- FDD uplink in the band 815-830 MHz, FDD downlink in the band 860-875 MHz, in Annex 1 referred to as FDD Band 18 in E-UTRA.
- FDD uplink in the band 830-845 MHz, FDD downlink in the band 875-890 MHz, in Annex 1 referred to as FDD Band XIX in UTRA or Band 19 in E-UTRA.
- FDD uplink in the band 832-862 MHz, FDD downlink in the band 791-821 MHz, in Annex 1 referred to as FDD Band XX in UTRA or Band 20 in E-UTRA.
- FDD uplink in the band 1 447.9-1 462.9 MHz[#], FDD downlink in the band 1 495.9-1 510.9 MHz[#], in Annex 1 referred to as FDD Band XXI in UTRA or Band 21 in E-UTRA.
- FDD uplink in the band 3 410-3 490 MHz[#], FDD downlink in the band 3 510-3 590 MHz[#], in Annex 1 referred to as FDD Band XXII in UTRA or Band 22 in E-UTRA.
- FDD uplink in the band 2 000-2 020 MHz[#], FDD downlink in the band 2 180-2 200 MHz[#], in Annex 1 referred to as Band 23 in E-UTRA.
- FDD uplink in the band 1 626.5-1 660.5 MHz[#], FDD downlink in the band 1 525-1559 MHz[#], in Annex 1 referred to as Band 24 in E-UTRA.
- FDD uplink in the band 1 850-1 915 MHz[#], FDD downlink in the band 1 930-1 995 MHz[#], in Annex 1 referred to as FDD Band XXV in UTRA or Band 25 in E-UTRA.

NOTE 2A – The unwanted emission limits defined in Annex 1 are for BS operating at least on one of the following combinations:

- E-UTRA intra-band contiguous carrier aggregation Band 1.
- E-UTRA inter-band carrier aggregation Band 1 and Band 5.
- DB-DC-HSDPA configurations with the uplink in Band I and Band VIII and downlink in Band I or Band VIII:
- DB-DC-HSDPA configurations with the uplink in Band II and Band IV and downlink in Band II or Band IV:
- DB-DC-HSDPA configurations with the uplink in Band I and Band V and downlink in Band I or Band V.
- DB-DC-HSDPA configurations with the uplink in Band I and Band XI and downlink in Band I or Band XI.
- DB-DC-HSDPA configurations with the uplink in Band II and Band V and downlink in Band II or Band V.

[#] All frequency bands or parts of the bands referenced in this Recommendation which are not identified for IMT in the ITU Radio Regulations have been marked with “#”.

- Single-band 4C-HSDPA in Band I with 3 downlink carriers.
- Dual-band 4C-HSDPA with 2 downlink carriers in Band I, 1 downlink carrier in Band VIII and uplink in Band I or VIII.
- Dual-band 4C-HSDPA with 3 downlink carriers in Band I, 1 downlink carrier in Band VIII and uplink in Band I or VIII.
- Dual-band 4C-HSDPA with 1 downlink carriers in Band II, 2 downlink carriers in Band IV and uplink in Band II or IV.
- Dual-band 4C-HSDPA with 2 downlink carriers in Band II, 1 downlink carriers in Band IV and uplink in Band II or IV.
- Dual-band 4C-HSDPA with 2 downlink carriers in Band II, 2 downlink carriers in Band IV and uplink in Band II or IV.
- Dual-band 4C-HSDPA with 1 downlink carrier in Band I, 2 downlink carriers in Band V and uplink in Band I or V.
- Dual-band 4C-HSDPA with 2 downlink carriers in Band I, 1 downlink carrier in Band V and uplink in Band I or V.
- Dual-band 4C-HSDPA with 2 downlink carriers in Band I, 2 downlink carriers in Band V and uplink in Band I or V.

Future versions of this Recommendation will include limits applicable to other frequency bands. Subject to further study, it is anticipated that such limits would be similar to those already contained in this Recommendation.

NOTE 3 – The unwanted emission limits defined in Annex 2 are for BS operating in the following arrangements (as named by 3GPP2) for either the FDD or TDD components and apply to both cdma2000 and HRPD operating modes except as noted:

Band class	Name	MS transmit frequency (MHz)	BS transmit frequency (MHz)
0	800 MHz band	824-849	869-894
1	1 900 MHz band	1 850-1 910	1 930-1 990
2	TACS band	872-915	917-960
3	JTACS band	887-925	832-870
4	Korean PCS band	1 750-1 780	1 840-1 870
5	450 MHz band	411-484	421-494
6	2 GHz band	1 920-1 980	2 110-2 170
7	Upper 700 MHz band	776-788	746-758
8	1 800 MHz band	1 710-1 785	1 805-1 880
9	900 MHz band	880-915	925-960
10	Secondary 800 MHz band	815-901	860-940
11	400 MHz European PAMR band	411-484 [#]	421-494 [#]
12	800 MHz PAMR band	870-876	915-921
13	2.5 GHz IMT-2000 extension band	2 500-2 570	2 620-2 690
14	US PCS 1.9 GHz band	1 850-1 915	1 930-1 995
15	AWS band	1 710-1 755	2 110-2 155
16 ⁽¹⁾	US 2.5 GHz band	2 502-2 568	2 624-2 690

Band class	Name	MS transmit frequency (MHz)	BS transmit frequency (MHz)
17 ⁽¹⁾	US 2.5 GHz forward link only band	N/A	2 624-2 690
18 ⁽¹⁾	700 MHz public safety band	787-799	757-769
19 ⁽¹⁾	Lower 700 MHz band	698-716	728-746

⁽¹⁾ No emissions specifications at this time.

NOTE 4 – The unwanted emission limits defined in Annex 3 are for BS operating at least one of the following arrangements:

- TDD in the band 1 900-1 920 MHz and 2 010-2 025 MHz referred to as Band a) in UTRA or Band 33 and 34, respectively, in E-UTRA.
- TDD in the band 1 850-1 910 MHz and 1 930-1 990 MHz referred to as Band b) in UTRA or Band 35 and 36, respectively, in E-UTRA.
- TDD in the band 1 910-1 930 MHz referred to as Band c) in UTRA or Band 37 in E-UTRA.
- TDD in the band 2 570-2 620 MHz referred to as Band d) in UTRA or Band 38 in E-UTRA.
- TDD in the band 1 880-1 920 MHz referred to as Band f) in UTRA or Band 39 in E-UTRA.
- TDD in the band 2 300-2 400 MHz referred to as Band e) in UTRA or Band 40 in E-UTRA.
- TDD in the band 2 496-2 690 MHz referred to as Band 41 in E-UTRA.
- TDD in the band 3 400-3 600 MHz referred to as Band 42 in E-UTRA.
- TDD in the band 3 600-3 800 MHz referred to as Band 43 in E-UTRA.

NOTE 4A – The unwanted emission limits defined in Annex 3 are for BS operating at least on one of the following combinations:

- E-UTRA intra-band contiguous carrier aggregation Band 40.

Future versions of this Recommendation will include limits applicable to other frequency bands. Subject to further study, it is anticipated that such limits would be similar to those already contained in this Recommendation.

NOTE 5 – The unwanted emission limits defined in Annex 6 are for BS operating in the following arrangement:

Band class group	Uplink MS transmit frequency (MHz)	Downlink MS receive frequency (MHz)	Channel bandwidth (MHz)	Duplex mode
1.A	2 300-2 400	2 300-2 400	8.75	TDD
1.B	2 300-2 400	2 300-2 400	5 and 10	TDD
2.D	2 305-2 320, 2 345-2 360	2 305-2 320, 2 345-2 360	3.5, 5 and 10	TDD
2.E	2 345-2 360	2 305-2 320	2 × 3.5, 2 × 5 and 2 × 10	FDD
2.F	2 345-2 360	2 305-2 320	5 (Uplink), 10 (Downlink)	FDD
3.A	2 500-2 690	2 500-2 690	5 and 10	TDD

Band class group	Uplink MS transmit frequency (MHz)	Downlink MS receive frequency (MHz)	Channel bandwidth (MHz)	Duplex mode
3.B	2 496-2 572 #	2 614-2 690 #	2 × 5 and 2 × 10	FDD
4.A	3 300-3 400 #	3 300-3 400 #	5	TDD
4.B	3 300-3 400 #	3 300-3 400 #	7	TDD
4.C	3 300-3 400 #	3 300-3 400 #	10	TDD
5L.A	3 400-3 600	3 400-3 600	5	TDD
5L.B	3 400-3 600	3 400-3 600	7	TDD
5L.C	3 400-3 600	3 400-3 600	10	TDD
5.D	3 400-3 500	3 500-3 600	2 × 5, 2 × 7 and 2 × 10	FDD
5H.A	3 600-3 800 #	3 600-3 800 #	5	TDD
5H.B	3 600-3 800 #	3 600-3 800 #	7	TDD
5H.C	3 600-3 800 #	3 600-3 800 #	10	TDD
6.A	1 710-1 770	2 110-2 170	2 × 5 and 2 × 10	FDD
6.B	1 920-1 980	2 110-2 170	2 × 5 and 2 × 10	FDD
6.C	1 710-1 785	1 805-1 880	2 × 5 and 2 × 10	FDD
7.A	698-862	698-862	5, 7 and 10	TDD
7.B	776-787	746-757	2 × 5 and 2 × 10	FDD
7.C	788-793, 793-798	758-763, 763-768	2×5	FDD
7.D	788-798	758-768	2×10	FDD
7.E	698-862	698-862	5, 7 and 10 (TDD) 2 × 5, 2 × 7 and 2 × 10 (FDD)	TDD/FDD
7.G	880-915	925-960	2 × 5 and 2 × 10	FDD
8.A	1 785-1 805, 1 880-1 920, 1 910-1 930, 2 010-2 025, 1 900-1 920	1 785-1 805, 1 880-1 920, 1 910-1 930, 2 010-2 025, 1 900-1 920	5 and 10	TDD

NOTE 6 – It should be noted that significant differences can exist between adjacent channel leakage power ratio (ACLR) information calculated from the integration of the envelope of the absolute spectrum masks compared to the specified values. This is because some or all of the spectrum masks are absolute (rather than relative to in-band power level) masks. Indeed, different margins exist between the guaranteed masks (used for compliance tests) and the shape of the actual emissions. If it represented a realistic transmit scenario, the specified ACLR values could not be met.

However, both the specified mask and the specified ACLR figures are to be met in accordance with, and compliance to, local/regional regulations wherever applicable. Caution is therefore advised when considering the emissions envelope mask for frequency sharing studies and when considering the emissions envelope mask for the actual transmission schemes, as the ACLR values would not be met if the transmissions were to fill the mask envelope. Where spectrum emission information is needed for adjacent band sharing studies the relevant specified ACLR data should preferably be used if it is available for the relevant frequency offset and bandwidth.

When the ACLR values are specified but are not applicable (e.g. studying the compatibility involving a system with a bandwidth for which the ACLR values are not applicable, e.g. 8 MHz) or when the ACLR values are not specified in this Recommendation, then ACLR values may be calculated from the spectrum mask and receiver filter characteristics if needed. An estimate derived from this calculation can be seen as a worst case. For the particular case of Europe, the mask used for deriving the ACLR value is the relevant ETSI mask (e.g. EN 302 544 for OFDMA TDD WMAN in the 2 500-2 690 MHz band).

NOTE 7 – Frequency bands or parts of the bands referenced in this Recommendation which are marked with “#” are not identified for IMT in the ITU Radio Regulations.

Annex 1 – IMT-2000 code division multiple access (CDMA) direct spread (universal terrestrial radio access (UTRA) FDD) base stations

Annex 2 – IMT-2000 CDMA multi-carrier (cdma-2000) base stations

Annex 3 – IMT-2000 CDMA TDD (UTRA TDD) base stations

Annex 4 – IMT-2000 time division multiple access (TDMA) single-carrier (UWC-136) base stations

Annex 5 – IMT-2000 frequency division multiple access (FDMA)/TDMA (digital enhanced cordless telecommunications (DECT)) base stations

Annex 6 – IMT-2000 OFDMA TDD WMAN base stations

Attachment to Annex 6 – Definition of test tolerance.

Annex 1

IMT-2000 code division multiple access (CDMA) direct spread (universal terrestrial radio access (UTRA) FDD) base stations

1 Measurement uncertainty

Values specified in this Annex differ from those specified in Recommendation ITU-R M.1457 since values in this Annex incorporate test tolerances defined in Recommendation ITU-R M.1545.

2 Spectrum mask

2.1 UTRA spectrum mask

The mask defined in Tables 1A to 1D may be mandatory in certain regions. In other regions this mask may not be applied.

For regions where this clause applies, the requirement should be met by a BS transmitting on a single radio frequency (RF) carrier configured in accordance with the manufacturer's specification. Emissions should not exceed the maximum level specified in Tables 1A to 1H for the appropriate BS maximum output power and operating band, in the frequency range from $\Delta f = 2.5$ MHz to Δf_{max} from the carrier frequency, where:

- Δf is the separation between the carrier frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency.
- f_{offset} is the separation between the carrier frequency and the centre of the measurement filter:
 - $f_{offset,max}$ is either 12.5 MHz or the offset to the BS transmit band edge, whichever is the greater.
- Δf_{max} is equal to $f_{offset,max}$ minus half of the bandwidth of the measuring filter.

TABLE 1A

**Spectrum emission mask values, BS maximum output power $P \geq 43$ dBm
for UTRA FDD bands ≤ 3 GHz**

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{offset} < 2.715 \text{ MHz}$	-12.5 dBm	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{offset} < 3.515 \text{ MHz}$	$-12.5 - 15$ ($f_{offset} - 2.715$) dBm	30 kHz
	$3.515 \text{ MHz} \leq f_{offset} < 4.0 \text{ MHz}$	-24.5 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{offset} < 8.0 \text{ MHz}$	-11.5 dBm	1 MHz
$7.5 \text{ MHz} \leq \Delta f < \Delta f_{max}$	$8.0 \text{ MHz} \leq f_{offset} < f_{offset,max}$	-11.5 dBm	1 MHz

TABLE 1B

**Spectrum emission mask values, BS maximum output power $39 \leq P < 43$ dBm
for UTRA FDD bands ≤ 3 GHz**

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{offset} < 2.715 \text{ MHz}$	-12.5 dBm	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{offset} < 3.515 \text{ MHz}$	$-12.5 - 15$ ($f_{offset} - 2.715$) dBm	30 kHz
	$3.515 \text{ MHz} \leq f_{offset} < 4.0 \text{ MHz}$	-24.5 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{offset} < 8.0 \text{ MHz}$	-11.5 dBm	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{max}$ MHz	$8.0 \text{ MHz} \leq f_{offset} < f_{offset,max}$	$P - 54.5$ dBm	1 MHz

TABLE 1C

**Spectrum emission mask values, BS maximum output power $31 \leq P < 39$ dBm
for UTRA FDD bands ≤ 3 GHz**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 2.715 \text{ MHz}$	$P - 51.5 \text{ dBm}$	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	$P - 51.5 - 15$ $(f_{\text{offset}} - 2.715) \text{ dBm}$	30 kHz
	$3.515 \text{ MHz} \leq f_{\text{offset}} < 4.0 \text{ MHz}$	$P - 63.5 \text{ dBm}$	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{\text{offset}} < 8.0 \text{ MHz}$	$P - 50.5 \text{ dBm}$	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}} \text{ MHz}$	$8.0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 54.5 \text{ dBm}$	1 MHz

TABLE 1D

**Spectrum emission mask values, BS maximum output power $P < 31$ dBm
for UTRA FDD bands ≤ 3 GHz**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 2.715 \text{ MHz}$	-20.5 dBm	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	$-20.5 - 15$ $(f_{\text{offset}} - 2.715) \text{ dBm}$	30 kHz
	$3.515 \text{ MHz} \leq f_{\text{offset}} < 4.0 \text{ MHz}$	-32.5 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{\text{offset}} < 8.0 \text{ MHz}$	-19.5 dBm	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}} \text{ MHz}$	$8.0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-23.5 dBm	1 MHz

TABLE 1E

**Spectrum emission mask values, BS maximum output power $P \geq 43$ dBm
for UTRA FDD bands > 3 GHz**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 2.715 \text{ MHz}$	-12.2 dBm	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	$-12.2 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 2.715 \right) \text{ dB}$	30 kHz
	$3.515 \text{ MHz} \leq f_{\text{offset}} < 4.0 \text{ MHz}$	-24.2 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{\text{offset}} < 8.0 \text{ MHz}$	-11.2 dBm	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$8.0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-11.2 dBm	1 MHz

TABLE 1F

**Spectrum emission mask values, BS maximum output power $39 \leq P < 43$ dBm
for UTRA FDD bands > 3 GHz**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 2.715 \text{ MHz}$	–12.2 dBm	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	$-12.2 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 2.715 \right) \text{ dB}$	30 kHz
	$3.515 \text{ MHz} \leq f_{\text{offset}} < 4.0 \text{ MHz}$	–24.2 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{\text{offset}} < 8.0 \text{ MHz}$	–11.2 dBm	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$8.0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 54.2 \text{ dB}$	1 MHz

TABLE 1G

**Spectrum emission mask values, BS maximum output power $31 \leq P < 39$ dBm
for UTRA FDD bands > 3 GHz**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 2.715 \text{ MHz}$	$P - 51.2 \text{ dB}$	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	$P - 51.2 \text{ dB} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 2.715 \right) \text{ dB}$	30 kHz
	$3.515 \text{ MHz} \leq f_{\text{offset}} < 4.0 \text{ MHz}$	$P - 63.2 \text{ dB}$	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{\text{offset}} < 8.0 \text{ MHz}$	$P - 50.2 \text{ dB}$	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$8.0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 54.2 \text{ dB}$	1 MHz

TABLE 1H

**Spectrum emission mask values, BS maximum output power $P < 31$ dBm
for UTRA FDD bands > 3 GHz**

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 2.715 \text{ MHz}$	-20.2 dBm	30 kHz
$2.7 \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	$-20.2 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 2.715 \right) \text{ dB}$	30 kHz
	$3.515 \text{ MHz} \leq f_{\text{offset}} < 4.0 \text{ MHz}$	-32.2 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{\text{offset}} < 8.0 \text{ MHz}$	-19.2 dBm	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$8.0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-23.2 dBm	1 MHz

For operation in Bands II, IV, V, X, XII, XIII, XIV and XXV the applicable additional requirement in Tables 2A, 2B or 2C apply in addition to the requirements in Tables 1A to 1D.

TABLE 2A

Additional spectrum emission limits for Bands II, IV, X, XXV

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Additional test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	-15 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$4.0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

TABLE 2B

Additional spectrum emission limits for Band V

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Additional test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	-15 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.55 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	100 kHz

TABLE 2C

Additional spectrum emission limits for Bands XII, XIII, XIV

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Additional test requirement	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.6 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 2.615 \text{ MHz}$	-13 dBm	30 kHz
$2.6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$2.65 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	100 kHz

For Home BS, the applicable additional requirements in Table 2D, 2D-1, 2E or 2E-1 apply in addition to the requirements in Tables 1A to 1H.

TABLE 2D

Additional spectrum emission limit for Home BS, BS maximum output power $6 \leq P \leq 20$ dBm for UTRA FDD bands ≤ 3 GHz

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Additional test requirement	Measurement bandwidth
$12.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$13 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 54.5 \text{ dBm}$	1 MHz

TABLE 2D-1

Additional spectrum emission limit for Home BS, BS maximum output power $6 \leq P \leq 20$ dBm for UTRA FDD bands > 3 GHz

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Additional test requirement	Measurement bandwidth
$12.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$13 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 54.2 \text{ dBm}$	1 MHz

TABLE 2E

Additional spectrum emission limit for Home BS, BS maximum output power $P < 6$ dBm for UTRA FDD bands ≤ 3 GHz

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Additional test requirement	Measurement bandwidth
$12.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$13 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-48.5 dBm	1 MHz

TABLE 2E-1

Additional spectrum emission limit for Home BS, BS maximum output power $P < 6$ dBm for UTRA FDD bands > 3 GHz

Frequency offset of measurement filter -3dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Additional test requirement	Measurement bandwidth
$12.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$13 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-48.2 dBm	1 MHz

In certain regions, the following requirement may apply for protection of digital terrestrial television. For UTRA BS operating in Band XX, the level of emissions in the band 470-790 MHz, measured in an 8 MHz filter bandwidth on centre frequencies F_{filter} according to Table 2F, shall not exceed the maximum emission level $P_{EM,N}$ declared by the manufacturer.

TABLE 2F

Declared emissions levels for protection of digital terrestrial television

Centre frequency, F_{filter}	Measurement bandwidth	Declared emission level (dBm)
$F_{filter} = 8 \times N + 306$ (MHz); $21 \leq N \leq 60$	8 MHz	$P_{EM,N}$

NOTE – The regional requirement is defined in terms of e.i.r.p. (equivalent isotropically radiated power), which is dependent on both the BS emissions at the antenna connector and the deployment (including antenna gain and feeder loss). The requirement defined above provides the characteristics of the base station needed to verify compliance with the regional requirement.

2.2 E-UTRA (LTE) spectrum mask

The operating band unwanted emission limits are defined from 10 MHz below the lowest frequency of the BS transmitter operating band up to 10 MHz above the highest frequency of the BS transmitter operating band.

The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier) and for all transmission modes foreseen by the manufacturer's specification.

The unwanted emission limits in the part of the operating band that falls in the spurious domain are consistent with Recommendation ITU-R SM.329 – Unwanted emissions in the spurious domain.

For wide area BS, the requirements of either § 2.2.1 (Category A limits) or § 2.2.2 (Category B limits) shall apply.

For local area BS, the requirements of § 2.2.3 shall apply (Category A and B).

For home BS, the requirements of § 2.2.4 shall apply (Category A and B).

For Category B operating band unwanted emissions, there are two options for the limits that may be applied regionally. Either the limits in § 2.2.2.1 or § 2.2.2.2 shall be applied.

Emissions should not exceed the maximum level specified in tables below, where:

- Δf is the separation between the channel edge frequency and the nominal –3 dB point of the measuring filter closest to the carrier frequency.
- f_{offset} is the separation between the channel edge frequency and the centre of the measuring filter.
- $f_{offset_{max}}$ is the offset to the frequency 10 MHz outside the BS transmitter operating band.
- Δf_{max} is equal to $f_{offset_{max}}$ minus half of the bandwidth of the measuring filter.

For a multi-carrier E-UTRA BS, the definitions above apply to the lower edge of the carrier transmitted at the lowest carrier frequency and the higher edge of the carrier transmitted at the highest carrier frequency.

The requirements of either § 2.2.1 or § 2.2.2 shall apply.

The additional operating band unwanted emission limits defined in § 2.2.2.1 may be mandatory in certain regions. In other regions it may not apply.

2.2.1 E-UTRA spectrum mask for wide area BS (Category A)

For E-UTRA BS operating in Bands 5, 6, 8, 12, 13, 14, 17, 18, and 19, emissions shall not exceed the maximum levels specified in Tables 3Aa) to 3Ac).

TABLE 3A

a) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands < 1 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.5 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-9.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$2.85 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	100 kHz

b) General operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands < 1 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-13.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	100 kHz

c) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands < 1 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.5 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-12.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm (Note 3)	100 kHz

For E-UTRA BS operating in Bands 1, 2, 3, 4, 7, 9, 10, 11, 21, 23, 24, 25, emissions shall not exceed the maximum levels specified in Table 3Ad) to 3Af):

For E-UTRA BS operating in Bands 22, emissions shall not exceed the maximum levels specified in Table 3Ag) to 3Ai).

TABLE 3A (continued)

d) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.5 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	–9.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm	1 MHz

e) General operating band unwanted emission limits for 3 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–13.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm	1 MHz

f) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.5 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–12.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm (Note 3)	1 MHz

TABLE 3A (end)

g) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.8 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-9.2 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

h) General operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.2 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-13.2 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

i) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.2 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-12.2 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm (Note 3)	1 MHz

2.2.2 E-UTRA spectrum mask for wide area BS (Category B)

For Category B operating band unwanted emissions, there are two options for the limits that may be applied regionally. Either the limits in § 2.2.2.1 or § 2.2.2.2 shall be applied.

2.2.2.1 E-UTRA spectrum mask for wide area BS (Category B, Option 1)

For E-UTRA BS operating in Bands 5, 8, 12, 13, 14, 17 and 20, emissions shall not exceed the maximum levels specified in Tables 3Ba) to 3Bc):

TABLE 3B

a) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands < 1 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.5 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-9.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$2.85 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-16 dBm	100 kHz

b) General operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands < 1 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-13.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-16 dBm	100 kHz

c) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands < 1 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.5 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-12.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-16 dBm (Note 3)	100 kHz

For E-UTRA BS operating in Bands 1, 2, 3, 4, 7, 10 and 25, emissions shall not exceed the maximum levels specified in Tables 3Bd) to 3Bf):

For E-UTRA BS operating in Band 22, emissions shall not exceed the maximum levels specified in Tables 3Bg) to 3Bf):

TABLE 3B (continued)

d) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.5 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	–9.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm	1 MHz

e) General operating band unwanted emission limits for 3 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–13.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm	1 MHz

f) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.5 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–12.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm (Note 3)	1 MHz

TABLE 3B (*end*)

g) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.8 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-9.2 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-15 dBm	1 MHz

h) General operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.2 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-13.2 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-15 dBm	1 MHz

i) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.2 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-12.2 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-15 dBm (Note 3)	1 MHz

2.2.2.2 E-UTRA spectrum mask for Wide Area BS (Category B, Option 2)

The limits in this subclause are intended for Europe and may be applied regionally for BS operating in Bands 3 and 8.

For an E-UTRA BS operating in Band 1, 3 or 8, emissions shall not exceed the maximum levels specified in Tables 3Ca) to 3Cd).

TABLE 3C

a) Regional operating band unwanted emission limits in Bands 1, 3, and 8 for 5, 10, 15 and 20 MHz channel bandwidth for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note1)
$0 \text{ MHz} \leq \Delta f < 0.2 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.215 \text{ MHz}$	–12.5 dBm	30 kHz
$0.2 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.215 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$	$-12.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.215 \right) \text{ dB}$	30 kHz
(Note 2)	$1.015 \text{ MHz} \leq f_{\text{offset}} < 1.5 \text{ MHz}$	–24.5 dBm	30 kHz
$1 \text{ MHz} \leq \Delta f \leq \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$1.5 \text{ MHz} \leq f_{\text{offset}} < \min(10.5 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–11.5 dBm	1 MHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm (Note 3)	1 MHz

b) Regional operating band unwanted emission limits in Bands 1, 3 and 8 for 3 MHz channel bandwidth for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 0.05 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.065 \text{ MHz}$	$6.5 \text{ dBm} - 60 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.015 \right) \text{ dB}$	30 kHz
$0.05 \text{ MHz} \leq \Delta f < 0.15 \text{ MHz}$	$0.065 \text{ MHz} \leq f_{\text{offset}} < 0.165 \text{ MHz}$	$3.5 \text{ dBm} - 160 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.065 \right) \text{ dB}$	30 kHz
$0.15 \text{ MHz} \leq \Delta f < 0.2 \text{ MHz}$	$0.165 \text{ MHz} \leq f_{\text{offset}} < 0.215 \text{ MHz}$	–12.5 dBm	30 kHz
$0.2 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.215 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$	$-12.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.215 \right) \text{ dB}$	30 kHz
(Note 2)	$1.015 \text{ MHz} \leq f_{\text{offset}} < 1.5 \text{ MHz}$	–24.5 dBm	30 kHz
$1 \text{ MHz} \leq \Delta f \leq 6 \text{ MHz}$	$1.5 \text{ MHz} \leq f_{\text{offset}} < 6.5 \text{ MHz}$	–11.5 dBm	1 MHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm	1 MHz

TABLE 3C (end)

**c) Regional operating band unwanted emission limits in Bands 1, 3 and 8
for 1.4 MHz channel bandwidth for Category B**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 0.05 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.065 \text{ MHz}$	$6.5 \text{ dBm} - 60 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.015 \right) \text{ dB}$	30 kHz
$0.05 \text{ MHz} \leq \Delta f < 0.15 \text{ MHz}$	$0.065 \text{ MHz} \leq f_{\text{offset}} < 0.165 \text{ MHz}$	$3.5 \text{ dBm} - 160 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.065 \right) \text{ dB}$	30 kHz
$0.15 \text{ MHz} \leq \Delta f < 0.2 \text{ MHz}$	$0.165 \text{ MHz} \leq f_{\text{offset}} < 0.215 \text{ MHz}$	–12.5 dBm	30 kHz
$0.2 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.215 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$	$-12.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.215 \right) \text{ dB}$	30 kHz
(Note 2)	$1.015 \text{ MHz} \leq f_{\text{offset}} < 1.5 \text{ MHz}$	–24.5 dBm	30 kHz
$1 \text{ MHz} \leq \Delta f \leq 2.8 \text{ MHz}$	$1.5 \text{ MHz} \leq f_{\text{offset}} < 3.3 \text{ MHz}$	–11.5 dBm	1 MHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm	1 MHz

2.2.3 E-UTRA spectrum mask for local area BS (Category A and B)

Local Area BS in E-UTRA bands ≤ 3 GHz, emissions shall not exceed the maximum levels specified in Tables 4a) to 4c).

For Local Area BS in E-UTRA bands >3 GHz emissions shall not exceed the maximum levels specified in Tables 4d) to 4f).

TABLE 4

**a) Local Area BS operating band unwanted emission limits for 1.4 MHz
channel bandwidth (E-UTRA bands ≤ 3 GHz)**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-19.5 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	–29.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$2.85 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–31 dBm	100 kHz

TABLE 4 (continued)

b) Local Area BS operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands ≤ 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-23.5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–33.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–35 dBm	100 kHz

c) Local Area BS operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands ≤ 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-28.5 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–35.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–37 dBm (Note 3)	100 kHz

d) Local Area BS operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands > 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-19.2 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	–29.2 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$2.85 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–31 dBm	100 kHz

TABLE 4 (*end*)

**e) Local Area BS operating band unwanted emission limits for 3 MHz channel bandwidth
(E-UTRA bands > 3 GHz)**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-23.2 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-33.2 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-35 dBm	100 kHz

**f) Local Area BS operating band unwanted emission limits for 5, 10, 15
and 20 MHz channel bandwidth (E-UTRA bands > 3 GHz)**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-28.2 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-35.2 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-37 dBm (Note 3)	100 kHz

2.2.4 E-UTRA spectrum mask for home BS (Category A and B)

For Home BS in E-UTRA bands ≤ 3 GHz, emissions shall not exceed the maximum levels specified in Tables 5a) to 5c).

For Home BS in E-UTRA bands > 3 GHz, emissions shall not exceed the maximum levels specified in Tables 5d) to 5f).

TABLE 5

**a) Home BS operating band unwanted emission limits for 1.4 MHz channel bandwidth
(E-UTRA bands ≤ 3 GHz)**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-28.5 \text{ dBm} + \frac{6}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-34.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 4)	1 MHz

TABLE 5 (continued)

**b) Home BS operating band unwanted emission limits for 3 MHz channel bandwidth
(E-UTRA bands ≤ 3 GHz)**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-32.5 \text{ dBm} - 2 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–38.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 4)	1 MHz

c) Home BS operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands ≤ 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-34.5 \text{ dBm} - \frac{6}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–40.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 3, Note 4)	1 MHz

**d) Home BS operating band unwanted emission limits for 1.4 MHz channel bandwidth
(E-UTRA bands > 3 GHz)**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-28.2 \text{ dBm} - \frac{6}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	–34.2 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 4)	1 MHz

TABLE 5 (end)

e) Home BS operating band unwanted emission limits for 3 MHz channel bandwidth
(E-UTRA bands > 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-32.2 \text{ dBm} - 2 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–38.2 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 4)	1 MHz

f) Home BS operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands > 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-34.2 \text{ dBm} - \frac{6}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–40.2 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 3, Note 4)	1 MHz

2.2.5 E-UTRA spectrum mask (additional limits)

The following requirements may apply in certain regions. For E-UTRA BS operating in Band 5, emissions shall not exceed the maximum levels specified in Table 6A.

TABLE 6A

Additional operating band unwanted emission limits for E-UTRA bands < 1 GHz

Channel bandwidth	Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
1.4 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.005 \text{ MHz} \leq f_{\text{offset}} < 0.995 \text{ MHz}$	–14 dBm	10 kHz
3 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.985 \text{ MHz}$	–13 dBm	30 kHz
5 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.985 \text{ MHz}$	–15 dBm	30 kHz
10 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	–13 dBm	100 kHz

TABLE 6A (*end*)

Channel bandwidth	Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
15 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	–13 dBm	100 kHz
20 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	–13 dBm	100 kHz
All	$1 \text{ MHz} \leq \Delta f < \Delta f_{\text{max}}$	$1.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm	100 kHz

The following requirements may apply in certain regions. For E-UTRA BS operating in Bands 2, 4, 10, 23, and 25, emissions shall not exceed the maximum levels specified in Table 6B.

TABLE 6B

Additional operating band unwanted emission limits for E-UTRA bands > 1 GHz

Channel bandwidth	Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
1.4 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.005 \text{ MHz} \leq f_{\text{offset}} < 0.995 \text{ MHz}$	–14 dBm	10 kHz
3 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.985 \text{ MHz}$	–13 dBm	30 kHz
5 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.985 \text{ MHz}$	–15 dBm	30 kHz
10 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	–13 dBm	100 kHz
15 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	–15 dBm	100 kHz
20 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	–16 dBm	100 kHz
All	$1 \text{ MHz} \leq \Delta f < \Delta f_{\text{max}}$	$1.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm	1 MHz

The following requirements may apply in certain regions. For E-UTRA BS operating in Bands 12, 13, 14 and 17, emissions shall not exceed the maximum levels specified in Table 6C.

TABLE 6C

Additional operating band unwanted emission limits for E-UTRA (Bands 12, 13, 14 and 17)

Channel bandwidth	Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
All	$0 \text{ MHz} \leq \Delta f < 100 \text{ kHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.085 \text{ MHz}$	–13 dBm	30 kHz
All	$100 \text{ kHz} \leq \Delta f < \Delta f_{\text{max}}$	$150 \text{ kHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm	100 kHz

In certain regions the following requirement may apply for protection of digital terrestrial television. For E-UTRA BS operating in Band 20, the level of emissions in the band 470-790 MHz, measured in an 8 MHz filter bandwidth on centre frequencies F_{filter} according to Table 6D, shall not exceed the maximum emission level $P_{EM,N}$ declared by the manufacturer. This requirement applies in the frequency range 470-790 MHz even though part of the range falls in the spurious domain.

TABLE 6D

Declared emissions levels for protection of digital terrestrial television

Filter centre frequency, F_{filter}	Measurement bandwidth	Declared emission level (dBm)
$F_{filter} = 8 \times N + 306$ (MHz); $21 \leq N \leq 60$	8 MHz	$P_{EM,N}$

NOTE – The regional requirement is defined in terms of e.i.r.p. (equivalent isotropically radiated power), which is dependent on both the BS emissions at the antenna connector and the deployment (including antenna gain and feeder loss). The requirement defined above provides the characteristics of the base station needed to verify compliance with the regional requirement.

The following notes are common to all subclauses in § 2.2:

NOTE 1 – As a general rule for the requirements in § 2.2, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

NOTE 2 – This frequency range ensures that the range of values of f_{offset} is continuous.

NOTE 3 – The requirement is not applicable when $\Delta f_{max} < 10$ MHz.

NOTE 4 – For Home BS, the parameter P is defined as the aggregated maximum power of all transmit antenna ports of Home BS.

In regions where FCC regulation applies, requirements for protection of GPS according to FCC Order DA 10-534 applies for operation in Band 24. The following normative requirement covers the base station, to be used together with other information about the site installation to verify compliance with the requirement in FCC Order DA 10-534. The requirement applies to BS operating in Band 24 to ensure that appropriate interference protection is provided to the 1 559-1 610 MHz band. This requirement applies to the frequency range 1 559-1 610 MHz, even though part of this range falls within the spurious domain.

The level of emissions in the 1 559-1 610 MHz band, measured in measurement bandwidth according to Table 6E shall not exceed the maximum emission levels P_{E_1MHz} and P_{E_1kHz} declared by the manufacturer.

TABLE 6E

Declared emissions levels for protection of the 1 559-1 610 MHz band

Operating Band	Frequency range	Declared emission level (dBW) (Measurement bandwidth = 1 MHz)	Declared emission level (dBW) of discrete emissions of less than 700 Hz bandwidth (Measurement bandwidth = 1 kHz)
24	1 559-1 610 MHz	P_{E_1MHz}	P_{E_1kHz}

NOTE – The regional requirement in FCC Order DA 10-534 is defined in terms of EIRP (effective isotropic radiated power), which is dependent on both the BS emissions at the antenna connector and the deployment (including antenna gain and feeder loss). The e.i.r.p. level is calculated using: $P_{EIRP} = P_E + G_{ant}$ where P_E denotes the BS unwanted emission level at the antenna connector, G_{ant} equals the BS antenna gain minus feeder loss. The requirement defined above provides the characteristics of the base station needed to verify compliance with the regional requirement.

3 Adjacent channel leakage power ratio

ACLR is the ratio of the transmitted power to the power measured after a receiver filter in the adjacent channel(s).

3.1 ACLR for UTRA

For UTRA, both the transmitted power and the received power are measured through a matched filter (root raised cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements should apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

The limit for ACLR should be as specified in Table 7A.

TABLE 7A
BS ACLR limits for UTRA

BS channel offset below the first or above the last carrier frequency used (MHz)	ACLR limit (dB)
5	44.2
10	49.2

NOTE 1 – In certain regions, the adjacent channel power (the root raised cosine (RRC) filtered mean power centred on an adjacent channel frequency) should be less than or equal to -7.2 dBm/3.84 MHz (for Band I, Band IX, Band XI and Band XXI) or $+2.8$ dBm/3.84 MHz (for Band VI and Band XIX) or as specified by the ACLR limit, whichever is the higher. This Note is not applicable for Home BS.

NOTE 2 – For Home BS, the adjacent channel power (the RRC filtered mean power centred on an adjacent channel frequency) shall be less than or equal to -42.7 dBm/3.84 MHz or as specified by the ACLR limit, whichever is the higher.

3.2 ACLR for E-UTRA (LTE)

The ACLR is defined with a square filter of bandwidth equal to the transmission bandwidth configuration of the transmitted signal (BW_{config}) centred on the assigned channel frequency and a filter centred on the adjacent channel frequency according to the tables below. The transmission bandwidth configuration is as specified in Table 7B.

TABLE 7B

Downlink transmission bandwidth configuration BW_{config}

Channel bandwidth $BW_{Channel}$ (MHz)	1.4	3	5	10	15	20
Transmission bandwidth configuration (BW_{config}) (MHz)	1.095	2.715	4.515	9.015	13.515	18.015

The ACLR is defined with a square filter of bandwidth equal to the transmission bandwidth configuration of the transmitted signal (BW_{config}) centred on the assigned channel frequency and a filter centred on the adjacent channel frequency according to the tables below.

For Category A Wide Area BS, either the ACLR limits in the tables below or the absolute limit of -13 dBm/MHz apply, whichever is less stringent.

For Category B Wide Area BS, either the ACLR limits in the tables below or the absolute limit of -15 dBm/MHz apply, whichever is less stringent.

For Local Area BS, either the ACLR limits in the tables below or the absolute limit of -32 dBm/MHz shall apply, whichever is less stringent.

For Home BS, either the ACLR limits in the tables below or the absolute limit of -50 dBm/MHz apply, whichever is less stringent.

For operation in paired spectrum, the ACLR shall be higher than the value specified in Table 7C.

TABLE 7C

BS ACLR limits for E-UTRA (LTE) in paired spectrum

Channel bandwidth of E-UTRA lowest (highest) carrier transmitted $BW_{Channel}$ (MHz)	BS adjacent channel centre frequency offset below the lowest or above the highest carrier centre frequency transmitted	Assumed adjacent channel carrier (informative)	Filter on the adjacent channel frequency and corresponding filter bandwidth	ACLR limit
1.4, 3.0, 5, 10, 15, 20	$BW_{channel}$	E-UTRA of same BW	Square (BW_{config})	44.2 dB
	$2 \times BW_{channel}$	E-UTRA of same BW	Square (BW_{config})	44.2 dB
	$BW_{channel}/2 + 2.5$ MHz	3.84 Mchip/s UTRA	RRC (3.84 Mchip/s)	44.2 dB
	$BW_{channel}/2 + 7.5$ MHz	3.84 Mchip/s UTRA	RRC (3.84 Mchip/s)	44.2 dB

NOTE 1 – $BW_{channel}$ and BW_{config} are the channel bandwidth and transmission bandwidth configuration of the E-UTRA transmitted signal on the assigned channel frequency.

NOTE 2 – The RRC filter shall be equivalent to the transmit pulse shape filter of root raised cosine and roll-off 0.22, with a chip rate as defined in this Table.

4 Transmitter spurious emission (conducted)

The spurious emission is measured at the BS RF output port.

For UTRA, the requirement applies at frequencies within the specified frequency ranges, which are more than 12.5 MHz under the first carrier frequency used or more than 12.5 MHz above the last carrier frequency used.

For E-UTRA (LTE), the requirement applies at frequencies within the specified frequency ranges, excluding the frequency range from 10 MHz below the lowest frequency of the BS transmitter operating band up to 10 MHz above the highest frequency of the BS transmitter operating band.

The requirement below should apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

Unless otherwise stated, all requirements are measured as mean power (r.m.s.).

4.1 Mandatory requirements

The requirements of either § 4.1.1 or § 4.1.2 applies.

4.1.1 Category A for UTRA and E-UTRA

The following requirements should be met in areas where Category A limits for spurious emissions, as defined in Recommendation ITU-R SM.329, are applied.

The power of any spurious emission should not exceed the limits specified in Table 8A.

TABLE 8A
BS spurious emission limit, Category A

Band	Maximum level	Measurement bandwidth	Note
9 kHz-150 kHz	-13 dBm	1 kHz	Bandwidth as in Recommendation ITU-R SM.329, § 4.1
150 kHz-30 MHz		10 kHz	Bandwidth as in Recommendation ITU-R SM.329, § 4.1
30 MHz-1 GHz		100 kHz	Bandwidth as in Recommendation ITU-R SM.329, § 4.1
1 GHz-12.75 GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329, § 2.5 Table 1
12.75 GHz – 5 th harmonic of the upper frequency edge of the DL operating band in GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329, § 2.5 Table 1 Applies only for E-UTRA Band 22 or UTRA Band XXII

4.1.2 Category B

4.1.2.1 Category B for UTRA

The following requirements should be met in areas where Category B limits for spurious emissions, as defined in Recommendation ITU-R SM.329, are applied.

The power of any spurious emission should not exceed the limits specified in Tables 8Ba) and 8Bb).

TABLE 8B

a) BS mandatory spurious emission limits, operating Bands I, II, III, IV, VII, X, XXII, XXV (Category B)

Band	Maximum level	Measurement bandwidth	Note
9 ↔ 150 kHz	−36 dBm	1 kHz	(1)
150 kHz ↔ 30 MHz	−36 dBm	10 kHz	(1)
30 MHz ↔ 1 GHz	−36 dBm	100 kHz	(1)
1 GHz ↔ $F_{low} - 10$ MHz	−30 dBm	1 MHz	(1)
$F_{low} - 10$ MHz ↔ $F_{high} + 10$ MHz	−15 dBm	1 MHz	(2)
$F_{high} + 10$ MHz ↔ 12.75 GHz	−30 dBm	1 MHz	(3)
12.75 GHz – 5 th harmonic of the upper frequency edge of the DL operating band in GHz	−30 dBm	1 MHz	(3), (4)

b) BS mandatory spurious emission limits, operating Bands V, VIII, XII, XIII, XIV, XX (Category B)

Band	Maximum level	Measurement bandwidth	Note
9 ↔ 150 kHz	−36 dBm	1 kHz	(1)
150 kHz ↔ 30 MHz	−36 dBm	10 kHz	(1)
30 MHz ↔ $F_{low} - 10$ MHz	−36 dBm	100 kHz	(1)
$F_{low} - 10$ MHz ↔ $F_{high} + 10$ MHz	−16 dBm	100 kHz	(2)
$F_{high} + 10$ MHz ↔ 1 GHz	−36 dBm	100 kHz	(1)
1 GHz ↔ 12.75 GHz	−30 dBm	1 MHz	(3)

(1) Bandwidth as in Recommendation ITU-R SM.329, § 4.1.

(2) Limit based on Recommendation ITU-R SM.329, § 4.3 and Annex 7.

(3) Bandwidth as in Recommendation ITU-R SM.329, § 4.1. Upper frequency as in Recommendation ITU-R SM.329, § 2.5 Table 1.

(4) Applies only for Band XXII.

F_{low} : The lowest downlink frequency of the operating band.

F_{high} : The highest downlink frequency of the operating band.

4.1.2.2 Category B for E-UTRA

The following requirements should be met in areas where Category B limits for spurious emissions, as defined in Recommendation ITU-R SM.329, are applied.

The power of any spurious emission should not exceed the limit specified in Table 8C.

TABLE 8C

Band	Maximum level	Measurement bandwidth	Note
9 kHz ↔ 150 kHz	−36 dBm	1 kHz	(1)
150 kHz ↔ 30 MHz	−36 dBm	10 kHz	(1)
30 MHz ↔ 1 GHz	−36 dBm	100 kHz	(1)
1 GHz ↔ 12.75 GHz	−30 dBm	1 MHz	(2)
12.75 GHz ↔ 5 th harmonic of the upper frequency edge of the DL operating band in GHz	−30 dBm	1 MHz	(2), (3)

(1) Bandwidth as in Recommendation ITU-R SM.329, § 4.1.

(2) Bandwidth as in Recommendation ITU-R SM.329, § 4.1. Upper frequency as in Recommendation ITU-R SM.329, § 2.5 Table 1.

(3) Applies only for E-UTRA Band 22.

4.2 Coexistence with other systems in the same geographical area

4.2.1 Coexistence with other systems in the same geographical area for UTRA

These requirements may be applied for the protection of UE, MS and/or BS operating in other frequency bands in the same geographical area. The requirements may apply in geographic areas in which both UTRA FDD and a system operating in another frequency band than the FDD operating band are deployed. The system operating in the other frequency band may be GSM900, DCS1800, PCS1900, GSM850, E-UTRA FDD and/or UTRA FDD.

The power of any spurious emission should not exceed the limits of Table 9A for a BS where requirements for coexistence with the system listed in the first column apply.

TABLE 9A

BS spurious emission limits for UTRA BS in geographic coverage area of systems operating in other frequency bands

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
GSM900	921-960 MHz	−57 dBm	100 kHz	This requirement does not apply to UTRA FDD operating in Band VIII
	876-915 MHz	−61 dBm	100 kHz	For the frequency range 880-915 MHz, this requirement does not apply to UTRA FDD operating in Band VIII
DCS1800	1 805-1 880 MHz	−47 dBm	100 kHz	This requirement does not apply to UTRA FDD operating in Band III
	1 710-1 785 MHz	−61 dBm	100 kHz	This requirement does not apply to UTRA FDD operating in Band III

TABLE 9A (continued)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
PCS1900	1 930-1 990 MHz	-47 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency Band II or band XXV
	1 850-1 910 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency Band II or band XXV
GSM850 or CDMA850	869-894 MHz	-57 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency Band V
	824-849 MHz	-61 dBm	100 kHz	This requirement does not apply to UTRA FDD BS operating in frequency Band V
UTRA FDD Band I or E-UTRA Band 1	2 110-2 170 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band I
	1 920-1 980 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in band I
UTRA FDD Band II or E-UTRA Band 2	1 930-1 990 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band II or band XXV
	1 850-1 910 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band II or band XXV
UTRA FDD Band III or E-UTRA Band 3	1 805-1 880 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band III or band IX
	1 710-1 785 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band III For UTRA BS operating in band IX, it applies for 1 710 MHz to 1 749.9 MHz and 1 784.9 MHz to 1 785 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 UTRA FDD BS operating in Band IV or band X
	1 710-1 755 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band IV or Band X
UTRA FDD Band V or E-UTRA Band 5	869-894 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band V
	824-849 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band V

TABLE 9A (continued)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band VI or XIX E-UTRA Band 6, 18 or 19	860-890 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band VI or XIX
	815-845 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band VI or XIX
UTRA FDD Band VII or E-UTRA Band 7	2 620-2 690 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band VII
	2 500-2 570 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band VII
UTRA FDD Band VIII or E-UTRA Band 8	925-960 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band VIII
	880-915 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band VIII
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 UTRA FDD BS operating in Band IX
	1 749.9-1 784.9 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band IX
UTRA FDD Band X or E-UTRA Band 10	2 110-2 170 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band IV or Band X
	1 710-1 770 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band X. For UTRA FDD BS operating in Band IV, 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 UTRA FDD BS operating in Band XI or XXI
	1 427.9-1 447.9 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XI
	1 447.9-1 462.9 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XXI
UTRA FDD Band XII or E-UTRA Band 12	729-746 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XII
	699-716 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XII

TABLE 9A (continued)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band XIII or E-UTRA Band 13	746-756 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XIII
	777-787 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XIII
UTRA FDD Band XIV or E-UTRA Band 14	758-768 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XIV
	788-798 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XIV
E-UTRA Band 17	734-746 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XII
	704-716 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XII
UTRA FDD Band XX or E-UTRA Band 20	791-821 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XX
	832-862 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XX
UTRA FDD Band XXII or E-UTRA Band 22	3 510-3 590 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XXII
	3 410-3 490 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XXII
E-UTRA Band 23	2 180-2 200 MHz	-52 dBm	1 MHz	
	2 000-2 020 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band II or XXV, where the limits are defined separately.
	2 000-2 010 MHz	-30 dBm	1 MHz	This requirement only applies to UTRA FDD BS operating in Band II or Band XXV. This requirement applies starting 5 MHz above the Band XXV downlink operating band. (Note 3)
	2 010-2 020 MHz	-49 dBm	1 MHz	
E-UTRA Band 24	1 525-1 559 MHz	-52 dBm	1 MHz	
	1 626.5-1 660.5 MHz	-49 dBm	1 MHz	

TABLE 9A (end)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band XXV or E-UTRA Band 25	1 930-1 995 MHz	-52 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band II or Band XXV
	1 850-1 915 MHz	-49 dBm	1 MHz	This requirement does not apply to UTRA FDD BS operating in Band XXV. For UTRA FDD BS operating in Band II, it applies for 1 910 MHz to 1 915 MHz
UTRA TDD in Band a) or E-UTRA Band 33	1 900-1 920 MHz	-52 dBm	1 MHz	
UTRA TDD in Band a) or E-UTRA Band 34	2 010-2 025 MHz	-52 dBm	1 MHz	
UTRA TDD in Band d) or E-UTRA Band 38	2 570-2 620 MHz	-52 dBm	1 MHz	
UTRA TDD in Band f) or E-UTRA Band 39	1 880-1 920 MHz	-52 dBm	1 MHz	Applicable in China
UTRA TDD in Band e) or E-UTRA Band 40	2 300-2 400 MHz	-52 dBm	1 MHz	
E-UTRA Band 41	2 496-2 690 MHz	-52 dBm	1 MHz	
E-UTRA Band 42	3 400-3 600 MHz	-52 dBm	1 MHz	
E-UTRA Band 43	3 600-3 800 MHz	-52 dBm	1 MHz	

NOTE 1 – The co-existence requirements do not apply for the 10 MHz frequency range immediately outside the downlink operating band (see Table 3.0). Emission limits for this excluded frequency range may be covered by local or regional requirements.

NOTE 2 – The table above 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 the 3GPP specifications.

NOTE 3 – This requirement does not apply to a Band II UTRA BS of an earlier release. In addition, it does not apply to an UTRA Band II BS from an earlier release manufactured before 31 December, 2012, which is upgraded to support Rel-10 features, where the upgrade does not affect existing RF parts of the radio unit related to this requirement.

4.2.2 Coexistence with other systems in the same geographical area for E-UTRA

These requirements may be applied for the protection of UE, MS and/or BS operating in other frequency bands in the same geographical area. The requirements may apply in geographic areas in which both E-UTRA BS and a system operating in another frequency band than the E-UTRA operating band are deployed. The system operating in the other frequency band may be GSM900, DCS1800, PCS1900, GSM850, UTRA FDD/TDD and/or E-UTRA.

The power of any spurious emission shall not exceed the limits of Table 9B for a BS where requirements for co-existence with the system listed in the first column apply.

TABLE 9B

BS spurious emission limits for E-UTRA BS in geographic coverage area of systems operating in other frequency bands

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
GSM900	921-960 MHz	-57 dBm	100 kHz	This requirement does not apply to E-UTRA 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 E-UTRA BS operating in Band 8
DCS1800	1 805-1 880 MHz	-47 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in Band 3
	1 710-1 785 MHz	-61 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in Band 3
PCS1900	1 930-1 990 MHz	-47 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in frequency Band 2, Band 25 or Band 36
	1 850-1 910 MHz	-61 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in frequency Band 2 or 25. This requirement does not apply to E-UTRA BS operating in frequency Band 35
GSM850	869-894 MHz	-57 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in frequency Band 5
	824-849 MHz	-61 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in frequency Band 5
UTRA FDD Band I or E-UTRA Band 1	2 110-2 170 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 1
	1 920-1 980 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 1
UTRA FDD Band II or E-UTRA Band 2	1 930-1 990 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 2 or 25
	1 850-1 910 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 2 or 25

TABLE 9B (continued)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band III or E-UTRA Band 3	1 805-1 880 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 3 or 9
	1 710-1 785 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 3 For E-UTRA BS operating in band 9, this requirement applies for 1 710 MHz to 1 749.9 MHz and 1 784.9 MHz to 1 785 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 E-UTRA BS operating in Band 4 or 10
	1 710-1 755 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 4 or 10
UTRA FDD Band V or E-UTRA Band 5	869-894 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 5
	824-849 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 5
UTRA FDD Band VI or XIX or E-UTRA Bands 6, 18, 19	860-895 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 6, 18 or 19
	815-830 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 18
	830-845 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Bands 6, 19
UTRA FDD Band VII or E-UTRA Band 7	2 620-2 690 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 7
	2 500-2 570 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 7
UTRA FDD Band VIII or E-UTRA Band 8	925-960 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 8
	880-915 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA 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 E-UTRA BS operating in Band 3 or 9
	1 749.9-1 784.9 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA 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 E-UTRA BS operating in Band 4 or 10
	1 710-1 770 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 10. For E-UTRA 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 E-UTRA BS operating in Band 11 or 21
	1 427.9-1 447.9 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 11
	1 447.9-1 462.9 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 21

TABLE 9B (continued)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band XII or E-UTRA Band 12	729-746 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 12
	699-716 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 12
UTRA FDD Band XIII or E-UTRA Band 13	746-756 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 13
	777-787 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 13
UTRA FDD Band XIV or E-UTRA Band 14	758-768 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 14
	788-798 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 14
E-UTRA Band 17	734-746 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 17
	704-716 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 17
UTRA FDD Band XX E-UTRA Band 20	791-821 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 20
	832-862 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA 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 E-UTRA BS operating in Band 22 or 42
	3 410-3 490 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 22 or 42
E-UTRA Band 23	2 180-2 200 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 23
	2 000-2 020 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 23, This requirement does not apply to BS operating in Bands 2 or 25, where the limits are defined separately
	2 000-2 010 MHz	-30 dBm	1 MHz	This requirement only applies to E-UTRA BS operating in Band 2 or Band 25. This requirement applies starting 5 MHz above the Band 25 downlink operating band (Note 4)
	2 010-2 020 MHz	-49 dBm	1 MHz	
E-UTRA Band 24	1 525-1 559 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 24
	1 626.5-1 660.5 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 24
UTRA FDD Band XXV or E-UTRA Band 25	1 930-1 995 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 2 or 25
	1 850-1 915 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 25. For E-UTRA BS operating in Band 2, it applies for 1 910 MHz to 1 915 MHz

TABLE 9B (*end*)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
UTRA TDD in Band a) or E-UTRA Band 33	1 900-1 920 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 33
UTRA TDD in Band a) or E-UTRA Band 34	2 010-2 025 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 34
UTRA TDD in Band b) or E-UTRA Band 35	1 850-1 910 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 35
UTRA TDD in Band b) or E-UTRA Band 36	1 930-1 990 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Bands 2 and 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 E-UTRA BS operating in Band 37. This unpaired band is defined in Recommendation ITU-R M.1036, but is pending any future deployment
UTRA TDD in Band d) or E-UTRA Band 38	2 570-2 620 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 38
UTRA TDD in Band f) or E-UTRA Band 39	1 880-1 920 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 39
UTRA TDD in Band e) or E-UTRA Band 40	2 300-2 400 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 40
E-UTRA Band 41	2 496-2 690 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 41
E-UTRA Band 42	3 400-3 600 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 42 or 43
E-UTRA Band 43	3 600-3 800 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 42 or 43

NOTE 4 – This requirement does not apply to a Band 2 E-UTRA BS of an earlier release. In addition, it does not apply to an E-UTRA Band 2 BS from an earlier release manufactured before 31 December, 2012, which is upgraded to support Rel-10 features, where the upgrade does not affect existing RF parts of the radio unit related to this requirement.

NOTE 1 – As defined in the scope for spurious emissions in this clause, the co-existence requirements in Table 9B do not apply for the 10 MHz frequency range immediately outside the BS transmit frequency range of an operating band (see Notes 2 and 3 for the scope). This is also the case when the transmit frequency range is adjacent to the band for the co-existence requirement in the table. Emission limits for this excluded frequency range may also be covered by local or regional requirements.

NOTE 2 – The table above assumes that two operating bands, where the frequency ranges defined either in Note 2 or 3 in the scope 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 this Recommendation.

NOTE 3 – 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, special co-existence requirements may apply that are not covered by this Recommendation.

The power of any spurious emission shall not exceed the limits of Table 9C for a Home BS where requirements for co-existence with a Home BS type listed in the first column apply.

TABLE 9C
Home BS spurious emissions limits for co-existence with Home BS
operating in other frequency bands

Type of coexistence BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band I or E-UTRA Band 1	1 920-1 980 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 1
UTRA FDD Band II or E-UTRA Band 2	1 850-1 910 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 2 or 25
UTRA FDD Band III or E-UTRA Band 3	1 710-1 785 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 3 For Home BS operating in Band 9, it applies for 1 710 MHz to 1 749.9 MHz and 1 784.9 MHz to 1 785 MHz
UTRA FDD Band IV or E-UTRA Band 4	1 710-1 755 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 4 or 10
UTRA FDD Band V or E-UTRA Band 5	824-849 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 5
UTRA FDD Bands VI, XIX or E-UTRA Bands 6, 18, 19	815-830 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 18. Requirement in subclause 6.6.4.5.3
	830-845 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Bands 6, 19
UTRA FDD Band VII or E-UTRA Band 7	2 500-2 570 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 7
UTRA FDD Band VIII or E-UTRA Band 8	880-915 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 8

TABLE 9C (continued)

Type of coexistence BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band IX or E-UTRA Band 9	1 749.9-1 784.9 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 3 or 9
UTRA FDD Band X or E-UTRA Band 10	1 710-1 770 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 10 For Home BS operating in Band 4, it applies for 1 755 MHz to 1 770 MHz
UTRA FDD Band XI, XXI or E-UTRA Bands 11, 21	1 427.9-1 447.9 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 11
	1 447.9-1 462.9 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 21
UTRA FDD Band XII or E-UTRA Band 12	699-716 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 12
UTRA FDD Band XIII or E-UTRA Band 13	777-787 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 13
UTRA FDD Band XIV or E-UTRA Band 14	788-798 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 14
E-UTRA Band 17	704-716 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 17
UTRA FDD Band XX or E-UTRA Band 20	832-862 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 20
UTRA FDD Band XXII or E-UTRA Band 22	3 410-3 490 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 22. This requirement does not apply to Home BS operating in Band 42
E-UTRA Band 24	1 626.5-1 660.5 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 24
UTRA FDD Band XXV or E-UTRA Band 25	1 850-1 915 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 25
UTRA TDD in Band a) or E-UTRA Band 33	1 900-1 920 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 33
UTRA TDD in Band a) or E-UTRA Band 34	2 010-2 025 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 34
UTRA TDD in Band b) or E-UTRA Band 35	1 850-1 910 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 35
UTRA TDD in Band b) or E-UTRA Band 36	1 930-1 990 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Bands 2 and 36
UTRA TDD in Band c) or E-UTRA Band 37	1 910-1 930 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 37. This unpaired band is defined in Rec. ITU-R M.1036, but is pending any future deployment

TABLE 9C (*end*)

Type of coexistence BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
UTRA TDD in Band d) or E-UTRA Band 38	2 570-2 620 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 38
UTRA TDD Band f) or E-UTRA Band 39	1 880-1 920 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 39
UTRA TDD Band e) or E-UTRA Band 40	2 300-2 400 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 40
E-UTRA Band 41	2 496-2 690 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 41
E-UTRA Band 42	3 400-3 600 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 42 or 43
E-UTRA Band 43	3 600-3 800 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 42 or 43

NOTE 1 – The coexistence requirements in Table 9C do not apply for the 10 MHz frequency range immediately outside the Home BS transmit frequency range of a downlink operating band.

NOTE 2 – The tables above assumes that two operating bands, where the frequency ranges in Table 5 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 this Recommendation.

NOTE 3 – 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, special co-existence requirements may apply that are not covered by this Recommendation.

4.3 Co-location with other base stations

4.3.1 Co-existence with co-located and co-sited base stations for UTRA

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

The power of any spurious emission shall not exceed the limits of Table 10A for a Wide Area (WA) BS where requirements for co-location with a BS type listed in the first column apply.

TABLE 10A

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

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
Macro GSM900	876-915 MHz	-98 dBm	100 kHz	
Macro DCS1800	1 710-1 785 MHz	-98 dBm	100 kHz	
Macro PCS1900	1 850-1 910 MHz	-98 dBm	100 kHz	
Macro GSM850 or CDMA850	824-849 MHz	-98 dBm	100 kHz	
WA UTRA FDD Band I or E-UTRA Band 1	1 920-1 980 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band II or E-UTRA Band 2	1 850-1 910 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band III or E-UTRA Band 3	1 710-1 785 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band IV or E-UTRA Band 4	1 710-1 755 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band V or E-UTRA Band 5	824-849 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VI, XIX or E-UTRA Bands 6, 18 or 19	815-845 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VII or E-UTRA Band 7	2 500-2 570 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VIII or E-UTRA Band 8	880-915 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band IX or E-UTRA Band 9	1 749.9-1 784.9 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band X or E-UTRA Band 10	1 710-1 770 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XI or E-UTRA Band 11	1 427.9-1 447.9 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XII or E-UTRA Band 12	699-716 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XIII or E-UTRA Band 13	777-787 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XIV or E-UTRA Band 14	788-798 MHz	-96 dBm	100 kHz	

TABLE 10A (*end*)

Type of co-located BS	Band for co-location requirement	Maximum Level	Measurement Bandwidth	Note
WA E-UTRA Band 17	704-716 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XX or E-UTRA Band 20	832-862 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XXI or E-UTRA Band 21	1 447.9-1 462.9 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XXII or E-UTRA Band 22	3 410-3 490 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42
WA E-UTRA Band 23	2 000-2 020 MHz	-96 dBm	100 kHz	
WA E-UTRA Band 24	1 626.5-1 660.5 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XXV or E-UTRA Band 25	1 850-1 915 MHz	-96 dBm	100 kHz	
WA UTRA TDD Band a) or E-UTRA Band 33	1 900-1 920 MHz	-86 dBm	1 MHz	
WA UTRA TDD Band a) or E-UTRA Band 34	2 010-2 025 MHz	-86 dBm	1 MHz	
WA UTRA TDD Band d) or E-UTRA Band 38	2 570-2 620 MHz	-86 dBm	1 MHz	
WA UTRA TDD Band f) or E-UTRA Band 39	1 880-1 920 MHz	-86 dBm	1 MHz	Applicable in China
WA UTRA TDD Band e) or E-UTRA Band 40	2 300-2 400 MHz	-86 dBm	1 MHz	
WA E-UTRA Band 41	2 496-2 690 MHz	-86 dBm	1 MHz	
WA E-UTRA Band 42	3 400-3 600 MHz	-86 dBm	1 MHz	
WA E-UTRA Band 43	3 600-3 800 MHz	-86 dBm	1 MHz	

NOTE 1 – The co-location requirements do not apply for the 10 MHz frequency range immediately outside the BS transmit frequency range of a downlink operating band (see Table 3.0). 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 TR 25.942.

NOTE 2 – The table above 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 this Recommendation.

The power of any spurious emission shall not exceed the limits of Table 10B for a medium range (MR) BS where requirements for co-location with a BS type listed in the first column apply.

TABLE 10B

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

Type of co-located BS	Band for co-location requirement	Maximum level	Measurement bandwidth	Note
Micro GSM900	876-915 MHz	-91 dBm	100 kHz	
Micro DCS1800	1 710-1 785 MHz	-96 dBm	100 kHz	
Micro PCS1900	1 850-1 910 MHz	-96 dBm	100 kHz	
Micro GSM850	824-849 MHz	-91 dBm	100 kHz	
MR UTRA FDD Band I	1 920-1 980 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band II	1 850-1 910 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band III	1 710-1 785 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band IV	1 710-1 755 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band V	824-849 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band VI or XIX	815-845 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band VII	2 500-2 570 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band VIII	880-915 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band IX	1 749.9-1 784.9 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band X	1 710-1 770 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band XI	1 427.9-1 447.9 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band XII	699-716 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band XIII	777-787 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band XIV	788-798 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band XX	832-862 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band XXI	1 447.9-1 462.9 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band XXII	3 410-3 490 MHz	-86 dBm	100 kHz	
MR UTRA FDD Band XXV	1 850-1 915 MHz	-86 dBm	100 kHz	

NOTE 1 – The co-location requirements do not apply for the 10 MHz frequency range immediately outside the BS transmit frequency range of a downlink operating band (see Table 3.0). 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 TR 25.942.

NOTE 2 – The table above 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 this Recommendation.

The power of any spurious emission shall not exceed the limits of Table 10C for a Local Area (LA) BS where requirements for co-location with a BS type listed in the first column apply.

TABLE 10C

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

Type of co-located BS	Band for co-location requirement	Maximum level	Measurement bandwidth	Note
Pico GSM900	876-915 MHz	-70 dBm	100 kHz	
Pico DCS1800	1 710-1 785 MHz	-80 dBm	100 kHz	
Pico PCS1900	1 850-1 910 MHz	-80 dBm	100 kHz	
Pico GSM850	824-849 MHz	-70 dBm	100 kHz	
LA UTRA FDD Band I or E-UTRA Band 1	1 920-1 980 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band II or E-UTRA Band 2	1 850-1 910 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band III or E-UTRA Band 3	1 710-1 785 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band IV or E-UTRA Band 4	1 710-1 755 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band V or E-UTRA Band 5	824-849 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band VI or XIX or E-UTRA Band 6, 18 or 19	815-845 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band VII or E-UTRA Band 7	2 500-2 570 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band VIII or E-UTRA Band 8	880-915 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band IX or E-UTRA Band 9	1 749.9-1 784.9 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band X or E-UTRA Band 10	1 710-1 770 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band XI or E-UTRA Band 11	1 427.9-1 447.9 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band XII or E-UTRA Band 12	699-716 MHz	-82 dBm	100 KHz	
LA UTRA FDD Band XIII or E-UTRA Band 13	777-787 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band XIV or E-UTRA Band 14	788-798 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band XX	832-862 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band XXI or E-UTRA Band 21	1 447.9-1 462.9 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band XXII or E-UTRA Band 22	3 410-3 490 MHz	-82 dBm	100 kHz	
LA E-UTRA Band 23	2 000-2 020 MHz	-82 dBm	100 kHz	
LA E-UTRA Band 24	1 626.5-1 660.5 MHz	-82 dBm	100 kHz	
LA UTRA FDD Band XXV or E-UTRA Band 25	1 850-1 915 MHz	-82 dBm	100 kHz	

TABLE 10C (*end*)

Type of co-located BS	Band for co-location requirement	Maximum level	Measurement bandwidth	Note
LA UTRA TDD Band a) or E-UTRA Band 33	1 900-1 920 MHz	-72 dBm	1 MHz	
LA UTRA TDD Band a) or E-UTRA Band 34	2 010-2 025 MHz	-72 dBm	1 MHz	
LA UTRA TDD Band d) or E-UTRA Band 38	2 570-2 620 MHz	-72 dBm	1 MHz	
LA UTRA TDD Band f) or E-UTRA Band 39	1 880-1 920 MHz	-72 dBm	1 MHz	Applicable in China
LA UTRA TDD Band e) or E-UTRA Band 40	2 300-2 400 MHz	-72 dBm	1 MHz	
LA E-UTRA Band 41	2 496-2 690 MHz	-72 dBm	1 MHz	
LA E-UTRA Band 42	3 400-3 600 MHz	-72 dBm	1 MHz	
LA E-UTRA Band 43	3 600-3 800 MHz	-72 dBm	1 MHz	

NOTE 1 – The co-location requirements do not apply for the 10 MHz frequency range immediately outside the BS transmit frequency range of a downlink operating band (see Table 3.0). 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 TR 25.942

NOTE 2 – The table above 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 this Recommendation.

4.3.2 Co-location with other base stations for E-UTRA

These requirements may be applied for the protection of other BS receivers when GSM900, DCS1800, PCS1900, GSM850, UTRA FDD, UTRA TDD and/or E-UTRA BS are co-located with an E-UTRA 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 10D for a Wide Area BS where requirements for co-location with a BS type listed in the first column apply.

TABLE 10D

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

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
Macro GSM900	876-915 MHz	-98 dBm	100 kHz	
Macro DCS1800	1 710-1 785 MHz	-98 dBm	100 kHz	
Macro PCS1900	1 850-1 910 MHz	-98 dBm	100 kHz	
Macro GSM850 or CDMA850	824-849 MHz	-98 dBm	100 kHz	
WA UTRA FDD Band I or E-UTRA Band 1	1 920-1 980 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band II or E-UTRA Band 2	1 850-1 910 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band III or E-UTRA Band 3	1 710-1 785 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band IV or E-UTRA Band 4	1 710-1 755 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band V or E-UTRA Band 5	824-849 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VI, XIX or E-UTRA Bands 6, 19	830-845 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VII or E-UTRA Band 7	2 500-2 570 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VIII or E-UTRA Band 8	880-915 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band IX or E-UTRA Band 9	1 749.9-1 784.9 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band X or E-UTRA Band 10	1 710-1 770 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XI or E-UTRA Band 11	1 427.9-1 447.9 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XII or E-UTRA Band 12	699-716 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XIII or E-UTRA Band 13	777-787 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XIV or E-UTRA Band 14	788-798 MHz	-96 dBm	100 kHz	
WA E-UTRA Band 17	704-716 MHz	-96 dBm	100 kHz	
WA E-UTRA Band 18	815-830 MHz	-96 dBm	100 kHz	
WA E-UTRA UTRA FDD Band XX Band 20	832-862 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XXI or E-UTRA Band 21	1 447.9-1 462.9 MHz	-96 dBm	100 kHz	

TABLE 10D (*end*)

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
WA UTRA FDD Band XXII or E-UTRA Band 22	3 410-3 490 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42
WA E-UTRA Band 23	2 000-2 020 MHz	-96 dBm	100 kHz	
WA E-UTRA Band 24	1 626.5-1 660.5 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XXV or E-UTRA Band 25	1 850-1 915 MHz	-96 dBm	100 kHz	
WA UTRA TDD in Band a) or E-UTRA Band 33	1 900-1 920 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 33
WA UTRA TDD in Band a) or E-UTRA Band 34	2 010-2 025 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 34
WA UTRA TDD in Band b) or E-UTRA Band 35	1 850-1 910 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 35
WA UTRA TDD in Band b) or E-UTRA Band 36	1 930-1 990 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Bands 2 and 36
WA UTRA TDD in Band c) or E-UTRA Band 37	1 910-1 930 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 37. This unpaired band is defined in Recommendation ITU-R M.1036, but is pending any future deployment
WA UTRA TDD in Band d) or E-UTRA Band 38	2 570-2 620 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 38
WA UTRA TDD Band f) or WA E-UTRA Band 39	1 880-1 920 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Bands 33 and 39
WA UTRA TDD Band e) or WA E-UTRA Band 40	2 300-2 400 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 40
WA E-UTRA Band 41	2 496-2 690 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 41
WA E-UTRA Band 42	3 400-3 600 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42 or 43
WA E-UTRA Band 43	3 600-3 800 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42 or 43

The power of any spurious emission shall not exceed the limits of Table 10E for a Local Area BS where requirements for co-location with a BS type listed in the first column apply.

TABLE 10E

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

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
Pico GSM900	876-915 MHz	-70 dBm	100 kHz	
Pico DCS1800	1 710-1 785 MHz	-80 dBm	100 kHz	
Pico PCS1900	1 850-1 910 MHz	-80 dBm	100 kHz	
Pico GSM850	824-849 MHz	-70 dBm	100 kHz	
LA UTRA FDD Band I or E-UTRA Band 1	1 920-1 980 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band II or E-UTRA Band 2	1 850-1 910 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band III or E-UTRA Band 3	1 710-1 785 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band IV or E-UTRA Band 4	1 710-1 755 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band V or E-UTRA Band 5	824-849 MHz	-88 dBm	100 kHz	
LA UTRA FDD Bands VI, XIX or E-UTRA Bands 6, 19	830-845 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band VII or E-UTRA Band 7	2 500-2 570 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band VIII or E-UTRA Band 8	880-915 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band IX or E-UTRA Band 9	1 749.9-1 784.9 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band X or E-UTRA Band 10	1 710-1 770 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XI or E-UTRA Band 11	1 427.9-1 447.9 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XII or E-UTRA Band 12	699-716 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XIII or E-UTRA Band 13	777-787 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XIV or E-UTRA Band 14	788-798 MHz	-88 dBm	100 kHz	
LA E-UTRA Band 17	704-716 MHz	-88 dBm	100 kHz	
LA E-UTRA Band 18	815-830 MHz	-88 dBm	100 KHz	
LA UTRA FDD Band XX or E-UTRA Band 20	832-862 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XXI or E-UTRA Band 21	1 447.9-1 462.9 MHz	-88 dBm	100 kHz	

TABLE 10E (*end*)

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
LA UTRA FDD Band XXII or E-UTRA Band 22	3 410-3 490 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42
LA E-UTRA Band 23	2 000-2 020 MHz	-88 dBm	100 kHz	
LA E-UTRA Band 24	1 626.5-1 660.5 MHz	-88 dBm	100 KHz	
LA UTRA FDD Band XXV or E-UTRA Band 25	1 850-1 915 MHz	-88 dBm	100 kHz	
LA UTRA TDD in Band a) or E-UTRA Band 33	1 900-1 920 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 33
LA UTRA TDD in Band a) or E-UTRA Band 34	2 010-2 025 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 34
LA UTRA TDD in Band b) or E-UTRA Band 35	1 850-1 910 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 35
LA UTRA TDD in Band b) or E-UTRA Band 36	1 930-1 990 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Bands 2 and 36
LA UTRA TDD in Band c) or E-UTRA Band 37	1 910-1 930 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 37. This unpaired band is defined in Recommendation ITU-R M.1036, but is pending any future deployment.
LA UTRA TDD in Band d) or E-UTRA Band 38	2 570-2 620 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 38
LA UTRA TDD Band f) E-UTRA Band 39	1 880-1 920 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Bands 33 and 39
LA UTRA TDD Band e) E-UTRA Band 40	2 300-2 400 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 40
LA E-UTRA Band 41	2 496-2 690 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 41
LA E-UTRA Band 42	3 400-3 600 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42 or 43
LA E-UTRA Band 43	3 600-3 800 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42 or 43

NOTE 1 – The co-location requirements in Tables 10D and 10E do not apply for the 10 MHz 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.

NOTE 2 – The table above assumes that two operating bands, where the corresponding eNode B 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.

NOTE 3 – Co-located TDD base stations that are synchronized and using the same operating band can transmit without special co-locations requirements. For unsynchronized base stations, special co-location requirements may apply.

4.4 Coexistence with PHS

This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA FDD or E-UTRA FDD are deployed. For UTRA FDD, this requirement is also applicable at specified frequencies falling between 12.5 MHz below the first carrier frequency used and 12.5 MHz above the last carrier frequency used. For E-UTRA FDD, this requirement is also applicable at specified frequencies falling between 10 MHz below the lowest BS transmitter frequency of the operating band and 10 MHz above the highest BS transmitter frequency of the operating band.

The power of any spurious emission should not exceed:

TABLE 11A

BS spurious emission limits for BS in geographic coverage area of PHS for UTRA

Band	Measurement bandwidth	Maximum level	Note
1 884.5 to 1 915.7 MHz	300 kHz	–41 dBm	

TABLE 11B

BS spurious emission limits for BS in geographic coverage area of PHS for E-UTRA

Band	Measurement bandwidth	Maximum level	Note
1 884.5-1 915.7 MHz	300 kHz	–41 dBm	Applicable when co-existence with PHS system operating in 1 884.5-1 915.7 MHz

4.5 Co-existence with services in adjacent frequency bands

This requirement may be applied for the protection in bands adjacent to Bands I or VII, in geographic areas in which both an adjacent band service and UTRA FDD are deployed.

TABLE 12

BS spurious emissions limits for protection of adjacent band services

Operating band	Band	Maximum level	Measurement bandwidth	Note
I	2 100-2 105 MHz	$-30 + 3.4 \cdot (f - 2\ 100\ \text{MHz})\ \text{dBm}$	1 MHz	
	2 175-2 180 MHz	$-30 + 3.4 \cdot (2\ 180\ \text{MHz} - f)\ \text{dBm}$	1 MHz	
VII	2 610-2 615 MHz	$-30 + 3.4 \cdot (f - 2\ 610\ \text{MHz})\ \text{dBm}$	1 MHz	
	2 695-2 700 MHz	$-30 + 3.4 \cdot (2\ 700\ \text{MHz} - f)\ \text{dBm}$	1 MHz	

NOTE – This requirement for the frequency range 2 610-2 615 MHz may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.

4.6 Protection of public safety operations

This requirement shall be applied to UTRA BS operating in Bands XIII and XIV to ensure that appropriate interference protection is provided to 700 MHz public safety operations. This requirement is also applicable at specified frequencies falling between 12.5 MHz below the first carrier frequency used and 12.5 MHz above the last carrier frequency used.

TABLE 13A

BS spurious emissions limits

Operating band	Band	Maximum level	Measurement bandwidth	Note
XIII	763-775 MHz	-46 dBm	6.25 kHz	
XIII	793-805 MHz	-46 dBm	6.25 kHz	
XIV	769-775 MHz	-46 dBm	6.25 kHz	
XIV	799-805 MHz	-46 dBm	6.25 kHz	

The following requirement shall be applied to E-UTRA BS operating in Bands 13 and 14 to ensure that appropriate interference protection is provided to 700 MHz public safety operations. This requirement is also applicable at the frequency range from 10 MHz below the lowest frequency of the BS transmitter operating band up to 10 MHz above the highest frequency of the BS transmitter operating band. The power of any spurious emission shall not exceed:

TABLE 13B

BS spurious emissions limits for protection of public safety operations

Operating band	Band	Maximum level	Measurement bandwidth	Note
13	763-775 MHz	-46 dBm	6.25 kHz	
13	793-805 MHz	-46 dBm	6.25 kHz	
14	769-775 MHz	-46 dBm	6.25 kHz	
14	799-805 MHz	-46 dBm	6.25 kHz	

4.7 Co-existence with Home UTRA BS operating in other bands

These requirements may be applied for the protection of Home UTRA BS receivers operating in other bands. These requirements are only applicable to Home UTRA BS.

The power of any spurious emission shall not exceed the limits of Table 14 for a Home UTRA BS where requirements for co-existence with a Home BS type listed in the first column apply.

TABLE 14

Home UTRA BS spurious emissions limits for co-existence with Home BS operating in other bands

Type of Home BS	Band for co-existence requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band I or E-UTRA Band 1	1 920-1 980 MHz	-71 dBm	100 kHz	
UTRA FDD Band II or E-UTRA Band 2	1 850-1 910 MHz	-71 dBm	100 kHz	
UTRA FDD Band III or E-UTRA Band 3	1 710-1 785 MHz	-71 dBm	100 kHz	
UTRA FDD Band IV or E-UTRA Band 4	1 710-1 755 MHz	-71 dBm	100 kHz	
UTRA FDD Band V or E-UTRA Band 5	824-849 MHz	-71 dBm	100 kHz	
UTRA FDD Band VI or XIX or XIX or E-UTRA Band 6, 19	815-845 MHz	-71 dBm	100 kHz	
UTRA FDD Band VII or E-UTRA Band 7	2 500-2 570 MHz	-71 dBm	100 kHz	
UTRA FDD Band VIII or E-UTRA Band 8	880-915 MHz	-71 dBm	100 kHz	
UTRA FDD Band IX or E-UTRA Band 9	1 749.9-1 784.9 MHz	-71 dBm	100 kHz	
UTRA FDD Band X or E-UTRA Band 10	1 710-1 770 MHz	-71 dBm	100 kHz	
UTRA FDD Band XI or E-UTRA Band 11	1 427.9-1 447.9 MHz	-71 dBm	100 kHz	
UTRA FDD Band XII or E-UTRA Band 12	699-716 MHz	-71 dBm	100 kHz	

TABLE 14 (*end*)

Type of Home BS	Band for co-existence requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band XIII or E-UTRA Band 13	777-787 MHz	-71 dBm	100 kHz	
UTRA FDD Band XIV or E-UTRA Band 14	788-798 MHz	-71 dBm	100 kHz	
E-UTRA Band 17	704-716 MHz	-71 dBm	100 kHz	
UTRA FDD Band XX or E-UTRA Band 20	832-862 MHz	-71 dBm	100 kHz	
UTRA FDD Band XXI or E-UTRA Band 21	1 447.9-1 462.9 MHz	-71 dBm	100 kHz	
UTRA FDD Band XXII or E-UTRA Band 22	3 410-3 490 MHz	-71 dBm	100 kHz	
E-UTRA FDD Band 24	1 626.5-1 660.5 MHz	-71 dBm	100 kHz	
UTRA FDD Band XXV or E-UTRA Band 25	1 850-1 915 MHz	-71 dBm	100 kHz	
UTRA TDD Band a) or E-UTRA Band 33	1 900-1 920 MHz	-71 dBm	100 kHz	
UTRA TDD Band a) or E-UTRA Band 34	2 010-2 025 MHz	-71 dBm	100 kHz	
UTRA TDD Band d) or E-UTRA Band 38	2 570-2 620 MHz	-71 dBm	100 kHz	
UTRA TDD Band f) or E-UTRA Band 39	1 880-1 920 MHz	-71 dBm	100 kHz	
UTRA TDD Band e) E-UTRA Band 40	2 300-2 400 MHz	-71 dBm	100 kHz	
E-UTRA Band 41	2 496-2 690 MHz	-71 dBm	100 kHz	
E-UTRA Band 42	3 400-3 600 MHz	-71 dBm	100 kHz	
E-UTRA Band 43	3 600-3 800 MHz	-71 dBm	100 kHz	

4.9 Protection of the E-UTRA FDD BS receiver of own or different BS

This requirement shall be applied for E-UTRA FDD operation in order to prevent the receivers of the BSs being desensitised by emissions from a 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 15.

TABLE 15

E-UTRA FDD BS spurious emissions limits for protection of the BS receive

	Frequency range	Maximum level	Measurement bandwidth	Note
Wide Area BS	FUL_low – FUL_high	-96 dBm	100 kHz	
Local Area BS	FUL_low – FUL_high	-88 dBm	100 kHz	
Home BS	FUL_low – FUL_high	-88 dBm	100 kHz	

4.10 Protection of the UTRA FDD BS receiver of own or different BS

This requirement shall be applied for UTRA FDD operation in order to prevent the receivers of the BSs being desensitised by emissions from a 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 15A for Wide Area UTRA BS, Table 15B for Medium Range UTRA BS, Table 15C for Local Area UTRA BS or Table 15D for Home BS UTRA BS.

TABLE 15A

Wide Area BS Spurious emissions limits for protection of the BS receiver

Operating band	Band	Maximum level	Measurement bandwidth	Note
I	1 920-1 980 MHz	-96 dBm	100 kHz	
II	1 850-1 910 MHz	-96 dBm	100 kHz	
III	1 710-1 785 MHz	-96 dBm	100 kHz	
IV	1 710-1 755 MHz	-96 dBm	100 kHz	
V	824-849 MHz	-96 dBm	100 kHz	
VI, XIX	815-845 MHz	-96 dBm	100 kHz	
VII	2 500-2 570 MHz	-96 dBm	100 kHz	
VIII	880-915 MHz	-96 dBm	100 kHz	
IX	1 749.9-1 784.9 MHz	-96 dBm	100 kHz	
X	1 710-1 770 MHz	-96 dBm	100 kHz	
XI	1 427.9-1 447.9 MHz	-96 dBm	100 kHz	
XII	699-716 MHz	-96 dBm	100 kHz	
XIII	777-787 MHz	-96 dBm	100 kHz	
XIV	788-798 MHz	-96 dBm	100 kHz	
XX	832-862 MHz	-96 dBm	100 kHz	
XXI	1 447.9-1 462.9 MHz	-96 dBm	100 kHz	
XXII	3 410-3 490 MHz	-96 dBm	100 kHz	
XXV	1 850-1 915 MHz	-96 dBm	100 kHz	

TABLE 15B

Medium Range BS Spurious emissions limits for protection of the BS receiver

Operating band	Band	Maximum level	Measurement bandwidth	Note
I	1 920-1 980 MHz	-86 dBm	100 kHz	
II	1 850-1 910 MHz	-86 dBm	100 kHz	
III	1 710-1 785 MHz	-86 dBm	100 kHz	
IV	1 710-1 755 MHz	-86 dBm	100 kHz	
V	824-849 MHz	-86 dBm	100 kHz	
VI, XIX	815-845 MHz	-86 dBm	100 kHz	
VII	2 500-2 570 MHz	-86 dBm	100 kHz	
VIII	880-915 MHz	-86 dBm	100 kHz	
IX	1 749.9-1 784.9 MHz	-86 dBm	100 kHz	
X	1 710-1 770 MHz	-86 dBm	100 kHz	
XI	1 427.9-1 447.9 MHz	-86 dBm	100 kHz	
XII	699-716 MHz	-86 dBm	100 kHz	
XIII	777-787 MHz	-86 dBm	100 kHz	
XIV	788-798 MHz	-86 dBm	100 kHz	
XX	832-862 MHz	-86 dBm	100 kHz	
XXI	1 447.9-1 462.9 MHz	-86 dBm	100 kHz	
XXII	3 410-3 490 MHz	-86 dBm	100 kHz	
XXV	1 850-1 915 MHz	-86 dBm	100 kHz	

TABLE 15C

Local Area BS Spurious emissions limits for protection of the BS receiver

Operating band	Band	Maximum level	Measurement bandwidth	Note
I	1 920-1 980 MHz	-82 dBm	100 kHz	
II	1 850-1 910 MHz	-82 dBm	100 kHz	
III	1 710-1 785 MHz	-82 dBm	100 kHz	
IV	1 710-1 755 MHz	-82 dBm	100 kHz	
V	824-849 MHz	-82 dBm	100 kHz	
VI, XIX	815-845 MHz	-82 dBm	100 kHz	
VII	2 500-2 570 MHz	-82 dBm	100 kHz	
VIII	880-915 MHz	-82 dBm	100 kHz	
IX	1 749.9-1 784.9 MHz	-82 dBm	100 kHz	
X	1 710-1 770 MHz	-82 dBm	100 kHz	
XI	1 427.9-1 447.9 MHz	-82 dBm	100 kHz	
XII	699-716 MHz	-82 dBm	100 kHz	
XIII	777-787 MHz	-82 dBm	100 kHz	
XIV	788-798 MHz	-82 dBm	100 kHz	
XX	832-862 MHz	-82 dBm	100 kHz	
XXI	1 447.9-1 462.9 MHz	-82 dBm	100 kHz	
XXII	3 410-3 490 MHz	-82 dBm	100 kHz	
XXV	1 850-1 915 MHz	-82 dBm	100 kHz	

TABLE 15D

Home BS Spurious emissions limits for protection of the BS receiver

Operating band	Band	Maximum level	Measurement bandwidth	Note
I	1 920-1 980 MHz	-82 dBm	100 kHz	
II	1 850-1 910 MHz	-82 dBm	100 kHz	
III	1 710-1 785 MHz	-82 dBm	100 kHz	
IV	1 710-1 755 MHz	-82 dBm	100 kHz	
V	824-849 MHz	-82 dBm	100 kHz	
VI, XIX	815-845 MHz	-82 dBm	100 kHz	
VII	2 500-2 570 MHz	-82 dBm	100 kHz	
VIII	880-915 MHz	-82 dBm	100 kHz	
IX	1 749.9-1 784.9 MHz	-82 dBm	100 kHz	
X	1 710-1 770 MHz	-82 dBm	100 kHz	
XI	1 427.9-1 447.9 MHz	-82 dBm	100 kHz	
XII	699-716 MHz	-82 dBm	100 kHz	
XIII	777-787 MHz	-82 dBm	100 kHz	
XIV	788-798 MHz	-82 dBm	100 kHz	
XX	832-862 MHz	-82 dBm	100 kHz	
XXI	1 447.9-1 462.9 MHz	-82 dBm	100 kHz	
XXII	3 410-3 490 MHz	-82 dBm	100 kHz	
XXV	1 850-1 915 MHz	-82 dBm	100 kHz	

5 Receiver spurious emission

The requirements apply to all BS with separate receiver and transmitter antenna port. The requirements should be applied under the condition of both transmitter and receiver are on with the transmitter port terminated.

For all BS with common receiver and transmitter antenna ports the transmitter spurious emission as specified above is valid.

The power of any spurious emission should not exceed the limit specified in Tables 16a).

For E-UTRA, in addition to the requirements in Table 16, the power of any spurious emission should not exceed the levels specified for protection of the E-UTRA FDD BS receiver of own or different BS in § 4.9 and for co-existence with other systems in the same geographical area in § 4.2.2, § 4.4, § 4.6. In addition, the co-existence requirements for co-located base stations specified in § 4.3.2 may also be applied.

For UTRA, in addition to the requirements in Table 16, the power of any spurious emission should not exceed the levels specified for protection of the UTRA FDD BS receiver of own or different BS in § 4.10 and for co-existence with other systems in the same geographical area in § 4.2.1, § 4.4, § 4.5, § 4.6, § 4.7. In addition, the co-existence requirements for co-located base stations specified in § 4.3.1 may also be applied.

TABLE 16

a) Receiver spurious emission limits

Band	Maximum level	Measurement bandwidth	Note
30 MHz-1 GHz	-57 dBm	100 kHz	
1-12.75 GHz	-47 dBm	1 MHz	
12.75 GHz – 5 th harmonic of the upper frequency edge of the UL operating band in GHz	-47 dBm	1 MHz	Applies only for E-UTRA Band Bands 22 or UTRA Band XXII

NOTE 1 – For UTRA, frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS transmitter are excluded.

NOTE 2 – For E-UTRA, the frequency range between $2.5 * BW_{channel}$ below the first carrier frequency and $2.5 * BW_{channel}$ above the last carrier frequency transmitted by the BS, where $BW_{channel}$ is the channel bandwidth, may be excluded from the requirement. However, frequencies that are more than 10 MHz below the lowest frequency of the BS transmitter operating band or more than 10 MHz above the highest frequency of the BS transmitter operating band shall not be excluded from the requirement.

b) Void

In addition, the requirements in Table 16c) may be applied to geographic areas in which both IMT-2000 CDMA TDD and IMT-2000 CDMA DS are deployed.

c) Void

Annex 2

IMT-2000 CDMA multi-carrier (cdma-2000) Base Stations

1 CDMA2000 and CDMA2000 high rate packet data (HRPD)

1.1 Spectrum mask

The emissions when transmitting on a single or all RF carriers supported by the BS and configured in accordance with the manufacturer's specification shall be less than the limits specified below. The spectrum emission mask values in Table 17A and Table 17AA apply to Band Classes 0, 2, 5, 7, 9 and 10 and shall be met when transmitting on a single or all RF carriers supported by the BS as indicated by the entries in the column Active carriers.

TABLE 17A

Macro BS Band Classes 0, 2, 5, 7, 9 and 10 spectrum emission mask values

For $ \Delta f $ within the range	Active carriers	Emission limit
750 kHz to 1.98 MHz	Single	-45 dBc/30 kHz
1.98 to 4.00 MHz	Single	-60 dBc/30 kHz, HRPD -60 dBc/30 kHz; Pout \geq 33 dBm, cdma2000 -27 dBm/30 kHz; 28 dBm \leq Pout < 33 dBm, cdma2000 -55 dBc/30 kHz; Pout < 28 dBm, cdma2000
3.25 to 4.00 MHz (Band Class 7 only)	All	-46 dBm/6.25 kHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = centre frequency – closer edge frequency (f) of the measurement filter. For multiple-carrier testing, Δf is defined for positive Δf as the centre frequency of the highest carrier – closer measurement edge frequency (f) and for negative Δf as the centre frequency of the lowest carrier – closer measurement edge frequency (f).

TABLE 17AA

Pico and femto BS Band Classes 0, 2, 5, 7, 9 and 10 spectrum emission mask values

For $ \Delta f $ within the range	Active carriers	Emission limit
750 kHz to 1.98 MHz	Single	-45 dBc/30 kHz
1.98 to 4.00 MHz	Single	-55 dBc/30 kHz
3.25 to 4.00 MHz (Band Class 7 only)	All	-46 dBm/6.25 kHz
1.98 to 2.25 MHz (MC test only)	All	-25 dBm/30 kHz
2.25 to 4.00 MHz (MC test only)	All	-26 dBm/1 MHz

Note to Table 17AA:

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = centre frequency – closer edge frequency (f) of the measurement filter. For multiple-carrier testing, Δf is defined for positive Δf as the centre frequency of the highest carrier – closer measurement edge frequency (f) and for negative Δf as the centre frequency of the lowest carrier – closer measurement edge frequency (f).

The spectrum emission mask values in Table 17B and Table 17BA apply to Band Classes 1, 4, 6, 8, 13, 14 and 15 and shall be met when transmitting on a single or all RF carriers supported by the BS as indicated by the entries in the column Active carriers.

TABLE 17B

Macro BS Band Classes 1, 4, 6, 8, 13, 14 and 15 spectrum emission mask values

For $ \Delta f $ within the range	Active carriers	Emission limit
885 kHz to 1.25 MHz	Single	–45 dBc/30 kHz
1.25 to 1.98 MHz	Single	More stringent of –45 dBc/30 kHz or –9 dBm/30 kHz
1.25 to 2.25 MHz (MC tests only)	All	–9 dBm/30 kHz
1.25 to 1.45 MHz (Band Classes 6, 8 and 13)	All	–13 dBm/30 kHz
1.45 to 2.25 MHz (Band Classes 6, 8 and 13)	All	$-\{13 + 17 \times (\Delta f - 1.45 \text{ MHz})\}$ dBm/30 kHz
1.98 MHz to 2.25 MHz	Single	–55 dBc/30 kHz, HPRD –55 dBc/30 kHz; Pout \geq 33 dBm, cdma2000 –22 dBm/30 kHz; 28 dBm \leq Pout < 33 dBm, cdma2000 –50 dBc/30 kHz; Pout < 28 dBm, cdma2000
2.25 MHz to 4.00 MHz	All	–13 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$. The emissions requirements shall apply for all values of Δf regardless of whether the measurement frequency falls inside or outside of the band or block edge. For single-carrier testing, Δf = centre frequency – closer measurement edge frequency (f). For multiple-carrier testing, Δf is defined for positive Δf as the closer measurement edge frequency (f) – centre frequency of the highest carrier and for negative Δf as the closer measurement edge frequency (f) – centre frequency of the lowest carrier.

TABLE 17BA

Pico and femto BS Band Classes 1, 4, 6, 8, 13, 14 and 15 spectrum emission mask values

For $ \Delta f $ within the range	Active carriers	Emission limit
885 kHz to 1.98 MHz	Single	-45 dBc/30 kHz
1.98 MHz to 2.25 MHz	Single	-55 dBc/30 kHz
1.25 to 2.25 MHz (MC test only)	All	-25 dBm/30 kHz
2.25 to 4.00 MHz (MC test only)	All	-26 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$. The emissions requirements shall apply for all values of Δf regardless of whether the measurement frequency falls inside or outside of the band or block edge. For single-carrier testing, Δf = centre frequency – closer measurement edge frequency (f). For multiple-carrier testing, Δf is defined for positive Δf as the closer measurement edge frequency (f) – centre frequency of the highest carrier and for negative Δf as the closer measurement edge frequency (f) – centre frequency of the lowest carrier.

The spectrum emission mask values in Table 17C and Table 17CA apply to Band Classes 11 and 12 and shall be met when transmitting on a single or all RF carriers supported by the BS as indicated by the entries in the column Active carriers.

TABLE 17C

Macro BS Band Classes 11 and 12 spectrum emission mask values

For $ \Delta f $ within the range	Active carriers	Emission limit
750 to 885 kHz	Single	$-45-15(\Delta f -750)/135$ dBc in 30 kHz
885 to 1125 kHz	Single	$-60-5(\Delta f -885)/240$ dBc in 30 kHz
1.125 to 1.98 MHz	Single	-65 dBc/30 kHz
1.98 to 4.00 MHz	Single	-75 dBc/30 kHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = centre frequency – closer measurement edge frequency (f). Δf is positive offset from the highest valid CDMA channel in the band subclass or negative offset from the lowest valid CDMA channel in the band subclass. The emission limits for Band Classes 11 and 12 (European PAMR bands) are designed to allow co-existence with incumbent services in Europe and are tighter than ITU Category B requirements.

TABLE 17CA

Pico and femto BS Band Classes 11 and 12 spectrum emission mask values

For $ \Delta f $ within the range	Active carriers	Emission limit
750 to 885 kHz	Single	$-45-15(\Delta f -750)/135$ dBc in 30 kHz
885 to 1 125 kHz	Single	$-60-5(\Delta f -885)/240$ dBc in 30 kHz
1.125 to 4 MHz	Single	-65 dBc/30 kHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = centre frequency – closer measurement edge frequency (f). Δf is positive offset from the highest valid CDMA channel in the band subclass or negative offset from the lowest valid CDMA channel in the band subclass. The emission limits for Band Classes 11 and 12 (European PAMR bands) are designed to allow co-existence with incumbent services in Europe and are tighter than ITU Category B requirements.

The spectrum emission mask values in Table 17D and Table 17DA apply to Band Class 3 and shall be met when transmitting on a single or all RF carriers supported by the BS as indicated by the entries in the column Active carriers.

TABLE 17D

Macro BS Band Class 3 spectrum emission mask values

Measurement frequency	Active carriers	For $ \Delta f $ within the range	Emission limit
> 832 MHz and \leq 834 MHz, > 838 MHz and \leq 846 MHz, > 860 MHz and \leq 895 MHz	Single	\geq 750 kHz and $<$ 1.98 MHz	-45 dBc/30 kHz
	Single	\geq 1.98 MHz	25 μ W (-16 dBm)/100 kHz; Pout \leq 30 dBm -60 dBc/100 kHz; 30 dBm $<$ Pout \leq 47 dBm Less stringent of 50 μ W (-13 dBm)/100 kHz or -70 dBc/100 kHz; Pout $>$ 47 dBm
> 810 MHz and \leq 860 MHz, except > 832 MHz and \leq 834 MHz, > 838 MHz and \leq 846 MHz	Single	$<$ 1.98 MHz	25 μ W (-16 dBm)/30 kHz; Pout \leq 30 dBm More stringent of -60 dBc / 30 kHz and 25 μ W (-16 dBm)/30 kHz; Pout $>$ 30 dBm
	Single	\geq 1.98 MHz	25 μ W (-16 dBm)/100 kHz; Pout \leq 30 dBm More stringent of -60 dBc/100 kHz and 25 μ W (-16 dBm)/100 kHz; Pout $>$ 30 dBm
\leq 810 MHz and $>$ 895 MHz	All	N/A	25 μ W (-16 dBm)/1 MHz; Pout \leq 44 dBm -60 dBc/1 MHz; 44 dBm $<$ Pout \leq 47 dBm Less stringent of 50 μ W (-13 dBm)/1 MHz or -70 dBc/1 MHz; Pout $>$ 47 dBm

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$. The emissions requirements shall apply for all values of Δf regardless of whether the measurement frequency falls inside or outside of the band or block edge. For single-carrier testing, Δf = centre frequency – closer measurement edge frequency (f). For multiple-carrier testing, Δf is defined for positive Δf as the closer measurement edge frequency (f) – centre frequency of the highest carrier and for negative Δf as the closer measurement edge frequency (f) – centre frequency of the lowest carrier. The upper and lower limits of the frequency measurement are currently 10 MHz and 3 GHz in Japan radio measurement documents.

TABLE 17DA

Pico and femto BS Band Class 3 spectrum emission mask values

Measurement frequency	Active carriers	For $ \Delta f $ within the range	Emission limit
> 832 MHz and \leq 834 MHz, > 838 MHz and \leq 846 MHz, > 860 MHz and \leq 895 MHz	Single	\geq 750 kHz and < 1.98 MHz	-45 dBc/30 kHz
	Single	\geq 1.98 MHz	-36 dBm/100 kHz
> 810 MHz and \leq 860 MHz, except > 832 MHz and \leq 834 MHz, > 838 MHz and \leq 846 MHz	Single	< 1.98 MHz	-16 dBm/30 kHz
	Single	\geq 1.98 MHz	-36 dBm/100 kHz
\leq 810 MHz and > 895 MHz	All	N/A	-36 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$. The emissions requirements shall apply for all values of Δf regardless of whether the measurement frequency falls inside or outside of the band or block edge. For single-carrier testing, Δf = centre frequency – closer measurement edge frequency (f). For multiple-carrier testing, Δf is defined for positive Δf as the closer measurement edge frequency (f) – centre frequency of the highest carrier and for negative Δf as the closer measurement edge frequency (f) – centre frequency of the lowest carrier. The upper and lower limits of the frequency measurement are currently 10 MHz and 3 GHz in Japan radio measurement documents.

1.2 Transmitter spurious emission

In areas where Category A limits for spurious emissions, as defined in Recommendation ITU-R SM.329, are applied, the spurious emissions when transmitting on all RF carriers supported by the BS and configured in accordance with the manufacturer's specification shall be less than the limits specified in Tables 18A and 18B.

TABLE 18A

Macro BS spurious emission limits, Category A

For $ \Delta f $ within the range	Emission limit	
> 4.00 MHz	9 kHz < f < 150 kHz	-13 dBm/1 kHz
	150 kHz < f < 30 MHz	-13 dBm/10 kHz
	30 MHz < f < 1 GHz	-13 dBm/100 kHz
	1 GHz < f < 12.75 GHz	-13 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = centre frequency – closer edge frequency (f) of the measurement filter. For multiple-carrier testing, Δf is defined for positive Δf as the centre frequency of the highest carrier – closer measurement edge frequency (f) and for negative Δf as the centre frequency of the lowest carrier – closer measurement edge frequency (f).

TABLE 18B

Additional transmitter spurious emission limits for macro BS in addition to Category A limits in areas where PHS is deployed

Measurement frequency	Measurement bandwidth	Emission limit	For protection of
1 884.5 to 1 915.7 MHz	300 kHz	-41 dBm	PHS

In areas where Category B limits for spurious emissions, as defined in Recommendation ITU-R SM.329, are applied, the spurious emissions for macro BS when transmitting on a single or all RF carriers supported by the BS and configured in accordance with the manufacturer's specification shall be less than the limits specified in Tables 19A and 19B. The emission limits in Table 19A shall be met when transmitting on all RF carriers supported by the BS. The emission limits in Table 19B shall be met when transmitting on a single or all RF carriers supported by the BS as indicated by the entries in the column Active carriers.

TABLE 19A

Spurious emission limits for macro BS, Category B

For $ \Delta f $ within the range	Emission limit	
> 4.00 MHz	$9 \text{ kHz} < f < 150 \text{ kHz}$	-36 dBm/1 kHz
	$150 \text{ kHz} < f < 30 \text{ MHz}$	-36 dBm/10 kHz
	$30 \text{ MHz} < f < 1 \text{ GHz}$	-36 dBm/100 kHz
	$1 \text{ GHz} < f < 12.75 \text{ GHz}$	-30 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where $\Delta f = \text{centre frequency} - \text{closer edge frequency } (f) \text{ of the measurement filter}$. For multiple-carrier testing, Δf is defined for positive Δf as the centre frequency of the highest carrier – closer measurement edge frequency (f) and for negative Δf as the centre frequency of the lowest carrier – closer measurement edge frequency (f).

TABLE 19B

Additional transmitter spurious emission limits for macro BS in addition to Category B limits

Measurement frequency	Active carriers	Emission limit	For protection of
921 to 960 MHz	All	-57 dBm/100 kHz	GSM 900 MS receive band
1 805 to 1 880 MHz	All	-47 dBm/100 kHz	DCS 1800 MS receive band
1 900 to 1 920 MHz 2 010 to 2 025 MHz	All	-52 dBm/1 MHz	IMT-2000 CDMA TDD
1 920 to 1 980 MHz	Single	-86 dBm/1 MHz	FDD BS receive band

When transmitting in Band Classes 0, 7, 9 and 10, the spurious emissions for macro BS shall be less than the limits specified in Tables 20A when transmitting on a single or all RF carriers supported by the BS as indicated by the entries in the column Active carriers.

TABLE 20A

**Additional Band Classes 0, 7, 9 and 10 spurious emission limits
for macro BS for ITU Category B only**

For $ \Delta f $ within the range	Active carriers	Emission limit	
> 4.00 MHz {Band Classes 0, 7, 9, and 10} (ITU Category B only)	All	-36 dBm/1 kHz; -36 dBm/10 kHz; -36 dBm/100 kHz; -30 dBm/1 MHz;	9 kHz < f < 150 kHz 150 kHz < f < 30 MHz 30 MHz < f < 1 GHz 1 GHz < f < 12.5 GHz

When transmitting in Band Classes 0, 7, 9 and 10, the spurious emissions for macro, pico, and femto BS shall be less than the limits specified in Tables 20B when transmitting on a single or all RF carriers supported by the BS as indicated by the entries in the column Active carriers.

TABLE 20B

**Additional Band Classes 0, 7, 9 and 10 spurious emission limits
for macro, pico and femto BS for ITU Category B only**

Frequency range	Active carriers	Emission limit
30 MHz < f < $f_{low} - 4.0$ MHz	All	-36 dBm/100 kHz
$f_{low} - 4.0$ MHz $\leq f \leq f_c - 4.0$ MHz	All	-16 dBm/100 kHz
$f_c + 4.0$ MHz $\leq f \leq f_{high} + 4.0$ MHz	All	-16 dBm/100 kHz
$f_{high} + 4.0$ MHz < f < 1.0 GHz	All	-36 dBm/100 kHz

f_{low} : Centre frequency of the lowest valid carrier in the band.

f_{high} : Centre frequency of the highest valid carrier in the band.

When transmitting in Band Classes 2 and 5, the spurious emissions for macro BS shall be less than the limits specified in Table 21 when transmitting on a single or all RF carriers supported by the BS as indicated by the entries in the column Active carriers.

TABLE 21

**Additional Band Classes 2 and 5 spurious emission limits
for macro BS for ITU Category B only**

For $ \Delta f $ within the range	Active carriers	Emission limit	
> 4.00 MHz {Band Classes 2 and 5} (ITU Category B only)	All	-36 dBm/1 kHz; -36 dBm/10 kHz; -30 dBm/1 MHz;	9 kHz < f < 150 kHz 150 kHz < f < 30 MHz 1 GHz < f < 12.5 GHz
4.00 to 6.40 MHz (Band Classes 2 and 5) (ITU Category B only)	All	-36 dBm/1 kHz	30 MHz < f < 1 GHz
6.40 to 16 MHz (Band Classes 2 and 5) (ITU Category B only)	All	-36 dBm/10 kHz	30 MHz < f < 1 GHz
> 16 MHz (Band Classes 2 and 5) (ITU Category B only)	All	-36 dBm/100 kHz	30 MHz < f < 1 GHz

When transmitting in Band Classes 11 and 12, the spurious emissions for macro BS shall be less than the limits specified in Tables 22A and 22B.

TABLE 22A

**Additional Band Classes 11 and 12 spurious emission limits
for macro BS for ITU Category B only**

For $ \Delta f $ within the range	Active carriers	Emission limit
> 6.00 MHz	All	-36 dBm/1 kHz; 9 kHz < f < 150 kHz -36 dBm/10 kHz; 150 kHz < f < 30 MHz -45 dBm/100 kHz; 30 MHz < f < 1 GHz -30 dBm/1 MHz; 1 GHz < f < 12.75 GHz

TABLE 22B

Additional Band Classes 11 and 12 spurious emission limits for macro BS

For $ \Delta f $ within the range	Active carriers	Emission limit
4.00 to 6.00 MHz	All	-36 dBm/100 kHz
> 6.00 MHz	All	-45 dBm/100 kHz

The emission limits for Band Classes 11 and 12 (European PAMR bands) are designed to allow co-existence with incumbent services in Europe and are tighter than ITU Category B requirements.

When transmitting in Band Classes 1, 4, 6, 8, 13, 14 and 15, the spurious emissions for macro BS shall be less than the limits specified in Table 23A. When transmitting in Band Class 6, the spurious emissions for macro BS shall be less than the limits specified in Table 23B.

TABLE 23A

**Additional Band Classes 1, 4, 6, 8, 13, 14 and 15 spurious emission limits
for macro BS for ITU Category B only**

Frequency range	Active carriers	Emission limit
$f_{low} - 4.0 \text{ MHz} < f < f_c - 4.0 \text{ MHz}$	All	-30 dBm/30 kHz
$f_c + 4.0 \text{ MHz} < f < f_{high} + 4.0 \text{ MHz}$	All	-30 dBm/30 kHz
$1 \text{ GHz} < f < f_{low} - 4.0 \text{ MHz}$	All	-30 dBm/1 MHz
$f_{high} + 4.0 \text{ MHz} < f < 12.5 \text{ GHz}$	All	-30 dBm/1 MHz

f_{low} : Centre frequency of the lowest valid carrier in the band.

f_{high} : Centre frequency of the highest valid carrier in the band.

TABLE 23B

Additional Band Class 6 spurious emission limits for macro BS

Measurement frequency	Active carriers	Emission limit	When coverage overlaps with
1 884.5 to 1 915.7 MHz	Single	−41 dBm/300 kHz	PHS
824 to 849 MHz	Single	−98 dBm/100 kHz (co-located only) −61 dBm/100 kHz (non-co-located)	GSM 850 CDMA 850
869 to 894 MHz	All	−57 dBm/100 kHz	GSM 850 CDMA 850
876 to 915 MHz	Single	−98 dBm/100 kHz (co-located only) −61 dBm/100 kHz (non-co-located)	GSM 900
921 to 960 MHz	All	−57 dBm/100 kHz	GSM 900
1 710 to 1 785 MHz	Single	−98 dBm/100 kHz (co-located only) −61 dBm/100 kHz (non-co-located)	DCS 1800
1 805 to 1 880 MHz	All	−47 dBm/100 kHz	DCS 1800
1 900 to 1 920 MHz and 2 010 to 2 025 MHz	Single	−86 dBm/1 MHz (co-located only)	UTRA-TDD
1 900 to 1 920 MHz and 2 010 to 2 025 MHz	All	−52 dBm/1 MHz	UTRA-TDD
1 920 to 1 980 MHz	Single	−86 dBm/1 MHz	Always

When transmitting in Band Class 10 in North America the spurious emissions shall be less than the limits specified in Table 24.

TABLE 24

**Additional Band Class 10 spurious emission limits
for the North American operation**

Measurement frequency	Emission limit
854.75 to 861 MHz	−40 dBm/30 kHz
866 to 869 MHz	−40 dBm/30 kHz

NOTE 1 – The Band Class 10 spurious emissions limit is designed to allow marginal co-existence with North American PMRS 800 MHz Public Safety services and is far tighter than the CFR 47 Part 90.691(a)(2) requirement.

When transmitting in Band Class 7, the spurious emissions for macro, pico and femto BS shall also be less than the limits specified in Table 25.

TABLE 25

Additional Band Class 7 spurious emission limits for macro, pico, and femto BS

Transmission frequency (MHz)	Measurement frequency (MHz)	Emission limit	Victim band
746-758	763-775 and 793-805	-46 dBm/6.25 kHz	Public safety
758-768	769-775 and 799-805	-46 dBm/6.25 kHz	Public safety

For both Category A and Category B, for pico and femto BS, the spurious emissions when transmitting on all RF carriers supported by the BS and configured in accordance with the manufacturer's specification shall be less than the limits specified in Table 25A.

TABLE 25A

Pico and femto BS spurious emission limits, Category A and Category B

For $ \Delta f $ within the range	Emission limit	
> 4.00 MHz	$9 \text{ kHz} < f < 150 \text{ kHz}$ $150 \text{ kHz} < f < 30 \text{ MHz}$ $30 \text{ MHz} < f < 1 \text{ GHz}$ $1 \text{ GHz} < f < 12.75 \text{ GHz}$	-36 dBm/1 kHz -36 dBm/10 kHz -46 dBm/100 kHz -36 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = centre frequency – closer edge frequency (f) of the measurement filter. For multiple-carrier testing, Δf is defined for positive Δf as the centre frequency of the highest carrier – closer measurement edge frequency (f) and for negative Δf as the centre frequency of the lowest carrier – closer measurement edge frequency (f).

The spectrum emission mask values in Table 25B apply to Band Class 3 pico and femto BS and shall be met when transmitting on a single or all RF carriers supported by the BS as indicated by the entries in the column Active carriers.

TABLE 25B

Pico and femto BS Band Class 3 spectrum emission mask values

Measurement frequency	Active carriers	For $ \Delta f $ within the range	Emission limit
> 832 MHz and \leq 834 MHz, > 838 MHz and \leq 846 MHz, > 860 MHz and \leq 895 MHz	Single	$\geq 4 \text{ MHz}$	-46 dBm/100 kHz
> 810 MHz and \leq 860 MHz, except > 832 MHz and \leq 834 MHz, > 838 MHz and \leq 846 MHz	Single	$\geq 4 \text{ MHz}$	-46 dBm/100 kHz
$\leq 810 \text{ MHz}$ and > 895 MHz	All	N/A	-36 dBm/1 MHz

Note to Table 25B:

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$. The emissions requirements shall apply for all values of Δf regardless of whether the measurement frequency falls inside or outside of the band or block edge. For single-carrier testing, $\Delta f = \text{centre frequency} - \text{closer measurement edge frequency } (f)$. For multiple-carrier testing, Δf is defined for positive Δf as the closer measurement edge frequency $(f) - \text{centre frequency of the highest carrier}$ and for negative Δf as the closer measurement edge frequency $(f) - \text{centre frequency of the lowest carrier}$. The upper and lower limits of the frequency measurement are currently 10 MHz and 3 GHz in Japan radio measurement documents.

When transmitting in Band Class 6, the spurious emissions for pico and femto BS shall be less than the limits specified in Table 25C.

TABLE 25C

Additional Band Class 6 spurious emission limits for pico and femto BS

Measurement frequency	Active carriers	Emission limit	When coverage overlaps with
1 884.5 to 1 915.7 MHz	Single	-41 dBm/300 kHz	PHS
824 to 849 MHz	Single	-61 dBm/100 kHz (non-co-located)	GSM 850 CDMA 850
869 to 894 MHz	All	-57 dBm/100 kHz	GSM 850 CDMA 850
876 to 915 MHz	Single	-61 dBm/100 kHz (non-co-located)	GSM 900
921 to 960 MHz	All	-57 dBm/100 kHz	GSM 900
1 710 to 1 785 MHz	Single	-61 dBm/100 kHz (non-co-located)	DCS 1800
1 805 to 1 880 MHz	All	-47 dBm/100 kHz	DCS 1800
1 900 to 1 920 MHz and 2 010 to 2 025 MHz	All	-52 dBm/1 MHz	UTRA-TDD
1 920 to 1 980 MHz	Single	-86 dBm/1 MHz	Always

When transmitting in Band Class 10 in North America the spurious emissions of pico and femto BS shall be less than the limits specified in Table 25D.

TABLE 25D

Additional Band Class 10 spurious emission limits for pico and femto BS for the North American operation

Measurement frequency	Emission limit
854.75 to 861 MHz	-50 dBm/30 kHz
866 to 869 MHz	-50 dBm/30 kHz

NOTE 1 – The Band Class 10 spurious emissions limit is designed to allow marginal co-existence with North American PMRS 800 MHz Public Safety services and is far tighter than the CFR 47 Part 90.691(a)(2) requirement.

1.3 Adjacent channel leakage power ratio

For a cdma2000 ACLR calculation, both the transmitted power and received power are measured with a rectangular filter. For a cdma2000 system, the first adjacent channel offset is 2.5 MHz and the second adjacent channel offset is 3.75 MHz for band classes in 1 900 MHz. For cellular band in 800 or 450 MHz, the first adjacent channel offset is 1.5 MHz (1.515 MHz for Band Class 3 because of the emission mask) and the second adjacent channel offset is 2.73 MHz (2.745 MHz for Band Class 3). The receiver bandwidth is 1.23 MHz.

The ACLR calculated from the masks are as given in Table 26 (assuming 43 dBm as transmit power).

TABLE 26
Base station ACLR limits

Band Class	ACLR1 (dB)	ACLR2 (dB)
0	29.36	43.87
1	42.96	55.56
2	29.36	43.87
3	29.43	49.10
4	42.96	55.56
5	29.36	43.87
6	52.89	55.56
7	29.36	44.22
8	52.89	55.56
9	29.36	43.87
10	29.36	43.87
11	48.57	58.87
12	48.57	58.87
13	52.89	55.56
14	42.96	55.56
15	42.96	55.56

For a cdma2000 system, the first adjacent channel offset is 2.5 MHz (ACLR1) and the second adjacent channel offset is 3.75 MHz for band classes in 1 900 MHz (ACLR2). For a cellular band in 800 or 450 MHz, the first adjacent channel offset is 1.5 MHz (1.515 MHz for Band Class 3 because of the emission mask) (ACLR1) and the second adjacent channel offset is 2.73 MHz (2.745 MHz for Band Class 3) (ACLR2).

1.4 Receiver spurious emission

This requirement only applies if the BS is equipped with a separate RF input port. The conducted spurious emissions at the BS RF input ports shall be not greater than the limits in Tables 27 and 28.

TABLE 27

General receiver spurious emission requirements

Frequency band	Measurement bandwidth	Maximum level	Note
$30 \text{ MHz} \leq f < 1 \text{ GHz}$	100 kHz	-57 dBm	For BC6 base stations, with the exception of the frequencies covered by Table 28, for which additional receiver spurious emission requirements apply
$1 \text{ GHz} \leq f \leq 12.75 \text{ GHz}$	1 MHz	-47 dBm	For BC6 base stations, with the exception of the frequencies covered by Table 29, for which additional receiver spurious emission requirements apply

For all frequencies within the mobile station receive and transmit bands, the conducted emissions shall be below the limits in Table 28.

TABLE 28

Additional receiver spurious emission requirements

Measurement bandwidth (kHz)	Maximum level (dBm)	Note
30	-80	Base receive band
30	-60	Base transmit band
300	-41	For BC6 base stations in $1\,884.5 \text{ MHz} \leq f < 1\,915.7 \text{ MHz}$
30	-47	Other frequencies

2 Ultra Mobile Broadband (UMB)

2.1 Spectrum mask

TABLE 29

Transmitter spurious emission limits for carrier frequencies less than 1 GHz

Frequency offset, Δf , MHz	Emission limit			Comments	
	–	Unit	RBW, kHz	Restrictions	Applicable range
0 to 5	$-7 - 7/5 \times \Delta f$	dBm	100	all CBW $\geq 5 \text{ MHz}$	$f_c < 1 \text{ GHz}$
5 to 10	-14	dBm	100	all CBW $\geq 5 \text{ MHz}$	$f_c < 1 \text{ GHz}$
10 to 20	-16	dBm	100	all CBW $\geq 5 \text{ MHz}$	$f_c < 1 \text{ GHz}$

TABLE 30

Band Class 0 additional transmitter spurious emission limits

Frequency offset, Δf , MHz	Emission limit			Comments	
	–	Unit	RBW, kHz	Restrictions	Applicable range
0 to 1	–10	dBm	100	CBW = 5 MHz	$f_c < 1$ GHz
0 to 1	–13	dBm	100	CBW = 10 MHz	$f_c < 1$ GHz
0 to 1	–16	dBm	100	CBW = 20 MHz	$f_c < 1$ GHz
1 to 5	–13	dBm	100	all CBW ≥ 5 MHz	$f_c < 1$ GHz
5 to 10	–14	dBm	100	all CBW ≥ 5 MHz	$f_c < 1$ GHz
10- Δf_{max}	–16	dBm	100	all CBW ≥ 5 MHz	$f_c < 1$ GHz

TABLE 31

Transmitter spurious emission limits for carrier frequencies higher than 1 GHz

Frequency offset, Δf , MHz	Emission limit			Comments	
	–	Unit	RBW, kHz	Restrictions	Applicable range
0 to 5	$-7 - 7/5 \times \Delta f$	dBm	100	all CBW ≥ 5 MHz	$f_c > 1$ GHz
5 to 10	–14	dBm	100	all CBW ≥ 5 MHz	$f_c > 1$ GHz
10 to Δf_{max}	–15	dBm	1 000	all CBW ≥ 5 MHz	$f_c > 1$ GHz

TABLE 32

Additional Band Classes 1 and 15 transmitter spurious emission limits

Frequency offset, Δf , MHz	Emission limit			Comments	
	–	Unit	RBW, kHz	Restrictions	Applicable range
0 to 1	–10	dBm	100	CBW = 5 MHz	$f_c > 1$ GHz
0 to 1	–13	dBm	100	CBW = 10 MHz	$f_c > 1$ GHz
0 to 1	–16	dBm	100	CBW = 20 MHz	$f_c > 1$ GHz
1 to 10	–13	dBm	1 000	all CBW ≥ 5 MHz	$f_c > 1$ GHz
10 to Δf_{max}	–15	dBm	1 000	all CBW ≥ 5 MHz	$f_c > 1$ GHz

2.2 Transmitter spurious emission

TABLE 33

Out-of-band spurious emission limits for Category A

Band	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		1 MHz	Note 2

NOTE 1 – Bandwidth as in Recommendation ITU-R SM.329 [2], § 4.1.

NOTE 2 – Bandwidth as in Recommendation ITU-R SM.329 [2], § 4.1. Upper frequency as in Recommendation ITU-R SM.329 [2], § 2.5 Table 1.

TABLE 34

Out of band spurious emission limits for Category B

Band	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

NOTE 1 – Bandwidth as in Recommendation ITU-R SM.329 [2], § 4.1.

NOTE 2 – Bandwidth as in Recommendation ITU-R SM.329 [2], § 4.1. Upper frequency as in Recommendation ITU-R SM.329 [4], § 2.5 Table 1.

TABLE 35

Wide area access network spurious emission limits for protection of access network receiver

Operating bands	Access network class	Maximum level	Measurement bandwidth
All	Wide Area	-96 dBm	100 kHz

TABLE 36

Access network spurious emissions limits for UMB FDD access networks in geographic coverage area of systems operating in other frequency bands

System type operating in the same geographical area	Band for co-existence requirement	Maximum level	Measurement bandwidth	Note
GSM900	921-960 MHz	-57 dBm	100 kHz	This requirement does not apply to UMB AN operating in BC9
	876-915 MHz	-61 dBm	100 kHz	For the frequency range 880-915 MHz, this requirement does not apply to UMB AN operating in BC9, since it is already covered by the requirement in Table 35
DCS1800	1 805-1 880 MHz	-47 dBm	100 kHz	This requirement does not apply to UMB AN operating in BC8
	1 710-1 785 MHz	-61 dBm	100 kHz	This requirement does not apply to UMB AN operating in BC8, since it is already covered by the requirement in Table 35
PCS1900	1 930-1 990 MHz	-47 dBm	100 kHz	This requirement does not apply to UMB AN operating in frequency BC1
	1 850-1 910 MHz	-61 dBm	100 kHz	This requirement does not apply to UMB AN operating in frequency BC1, since it is already covered by the requirement in Table 35
GSM850	869-894 MHz	-57 dBm	100 kHz	This requirement does not apply to UMB AN operating in frequency BC0
	824-849 MHz	-61 dBm	100 kHz	This requirement does not apply to UMB AN operating in frequency BC0, since it is already covered by the requirement in Table 35
UMB FDD BC6	2 110-2 170 MHz	-52 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC6
	1 920-1 980 MHz	-49 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC6, since it is already covered by the requirement in Table 35
UMB FDD BC1	1 930-1 990 MHz	-52 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC1
	1 850-1 910 MHz	-49 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC1, since it is already covered by the requirement in Table 35
MB FDD BC8	1 805-1 880 MHz	-52 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC8
	1 710-1 785 MHz	-49 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC8, since it is already covered by the requirement in Table 35
UMB FDD BC15	2 110-2 155 MHz	-52 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC15
	1 710-1 755 MHz	-49 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC15, since it is already covered by the requirement in Table 35

TABLE 36 (end)

System type operating in the same geographical area	Band for co-existence requirement	Maximum level	Measurement bandwidth	Note
UMB FDD BC0	869-894 MHz	-52 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC0
	824-849 MHz	-49 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC0, since it is already covered by the requirement in Table 35
UMB FDD BC13	2 620-2 690 MHz	-52 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC13
	2 500-2 570 MHz	-49 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC13, since it is already covered by the requirement in Table 35
UMB FDD BC9	925-960 MHz	-52 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC9
	880-915 MHz	-49 dBm	1 MHz	This requirement does not apply to UMB AN operating in BC9, since it is already covered by the requirement in Table 35

TABLE 37

Access network spurious emissions limits for wide area FDD AN co-located with another access network

Type of co-located AN	Band for co-location requirement	Maximum level	Measurement bandwidth
Macro GSM900	876-915 MHz	-98 dBm	100 kHz
Macro DCS1800	1 710-1 785 MHz	-98 dBm	100 kHz
Macro PCS1900	1 850-1 910 MHz	-98 dBm	100 kHz
Macro GSM850	824-849 MHz	-98 dBm	100 kHz
WA UMB FDD BC6	1 920-1 980 MHz	-96 dBm	100 kHz
WA UMB FDD BC1	1 850-1 910 MHz	-96 dBm	100 kHz
WA UMB FDD BC8	1 710-1 785 MHz	-96 dBm	100 kHz
WA UMB FDD BC15	1 710-1 755 MHz	-96 dBm	100 kHz
WA UMB FDD BC0	824-849 MHz	-96 dBm	100 kHz
WA UMB FDD BC13	2 500-2 570 MHz	-96 dBm	100 kHz
WA UMB FDD BC9	880-915 MHz	-96 dBm	100 kHz

TABLE 38

FDD AN Spurious emissions limits for access network in geographic coverage area of PHS

Band	Maximum level	Measurement bandwidth
1 884.5-1 919.6 MHz	-41 dBm	300 kHz

Current region-specific radio regulation rules shall also apply.

2.3 Adjacent channel leakage power ratio

TABLE 39
ACLR limits

UMB	ACLR limit for 1 st and 2 nd adjacent channel relative to assigned channel frequency (dB)				
Channel BW (MHz)		UMB ¹	UMB ¹	UMB ¹	UMB ¹
		< 5.0 MHz	5.0 MHz	10 MHz	20 MHz
< 5	ACLR 1	45	–	–	–
	ACLR 2	45	–	–	–
5	ACLR 1	45	45	–	–
	ACLR 2	45	45	–	–
10	ACLR 1	45	–	45	–
	ACLR 2	45	–	45	–
20	ACLR 1	45	–	–	45
	ACLR 2	45	–	–	45

NOTE 1 – Measured with a rectangular filter with a bandwidth equal to the channel bandwidth on the first or second adjacent channel.

Annex 3

IMT-2000 CDMA TDD (UTRA TDD) base stations

1 Measurement uncertainty

Values specified in this Annex differ from those specified in Recommendation ITU-R M.1457 since values in this Annex incorporate test tolerances defined in Recommendation ITU-R M.1545.

2 Spectrum mask

2.1 UTRA 3.84 Mchip/s TDD option

The spectrum emission mask specifies the limit of the transmitter OoB emissions at frequency offsets from the assigned channel frequency of the wanted signal between 2.5 MHz and 12.5 MHz.

The requirement should be met by a BS transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions should not exceed the maximum level specified in Tables 40A to 40D in the frequency range of f_{offset} from 2.515 MHz to Δf_{max} from the carrier frequency, where:

- f_{offset} is the separation between the carrier frequency and the centre of the measurement filter;
- $f_{\text{offset}_{\text{max}}}$ is either 12.5 MHz or the offset to the universal mobile telecommunications system (UMTS) transmit band edge, whichever is the greater.

– Δf_{max} is equal to $f_{offset,max}$ minus half of the bandwidth of the measuring filter.

The spectrum emissions measured should not exceed the maximum level specified in Tables 40A to 40D for the appropriate BS rated output power.

TABLE 40A

Spectrum emission mask values, BS maximum output power $P \geq 43$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{offset} < 2.715 \text{ MHz}$	–12.5 dBm	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{offset} < 3.515 \text{ MHz}$	$-12.5 \text{ dBm} - 15 \cdot \left(\frac{f_{offset}}{\text{MHz}} - 2.715 \right) \text{ dB}$	30 kHz
(See Note 1)	$3.515 \text{ MHz} \leq f_{offset} < 4.0 \text{ MHz}$	–24.5 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f \leq \Delta f_{max}$	$4.0 \text{ MHz} \leq f_{offset} < f_{offset,max}$	–11.5 dBm	1 MHz

TABLE 40B

Spectrum emission mask values, BS maximum output power $39 \leq P < 43$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{offset} < 2.715 \text{ MHz}$	–12.5 dBm	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{offset} < 3.515 \text{ MHz}$	$-12.5 \text{ dBm} - 15 \cdot \left(\frac{f_{offset}}{\text{MHz}} - 2.715 \right) \text{ dB}$	30 kHz
(See Note 1)	$3.515 \text{ MHz} \leq f_{offset} < 4.0 \text{ MHz}$	–24.5 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{offset} < 8.0 \text{ MHz}$	–11.5 dBm	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{max}$	$8.0 \text{ MHz} \leq f_{offset} < f_{offset,max}$	$P - 54.5 \text{ dB}$	1 MHz

TABLE 40C

Spectrum emission mask values, BS maximum output power $31 \leq P < 39$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 2.715 \text{ MHz}$	$P - 51.5 \text{ dB}$	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	$P - 51.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 2.715 \right) \text{ dB}$	30 kHz
(See Note 1)	$3.515 \text{ MHz} \leq f_{\text{offset}} < 4.0 \text{ MHz}$	$P - 63.5 \text{ dB}$	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{\text{offset}} < 8.0 \text{ MHz}$	$P - 50.5 \text{ dB}$	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$8.0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 54.5 \text{ dB}$	1 MHz

TABLE 40D

Spectrum emission mask values, BS maximum output power $P < 31$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$2.5 \text{ MHz} \leq \Delta f < 2.7 \text{ MHz}$	$2.515 \text{ MHz} \leq f_{\text{offset}} < 2.715 \text{ MHz}$	-20.5 dBm	30 kHz
$2.7 \text{ MHz} \leq \Delta f < 3.5 \text{ MHz}$	$2.715 \text{ MHz} \leq f_{\text{offset}} < 3.515 \text{ MHz}$	$-20.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 2.715 \right) \text{ dB}$	30 kHz
(See Note 1)	$3.515 \text{ MHz} \leq f_{\text{offset}} < 4.0 \text{ MHz}$	-32.5 dBm	30 kHz
$3.5 \text{ MHz} \leq \Delta f < 7.5 \text{ MHz}$	$4.0 \text{ MHz} \leq f_{\text{offset}} < 8.0 \text{ MHz}$	-19.5 dBm	1 MHz
$7.5 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$8.0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-23.5 dBm	1 MHz

NOTE 1 – This frequency range ensures that the range of values of f_{offset} is continuous.

2.2 UTRA 1.28 Mchip/s TDD option

The spectrum emission mask specifies the limit of the transmitter OoB emissions at frequency offsets from the assigned channel frequency of the wanted signal between 0.8 MHz and 4.0 MHz.

The requirement should be met by a BS transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions should not exceed the maximum level specified in Tables 41A to 41C in the frequency range of f_{offset} from 0.815 MHz to Δf_{max} from the carrier frequency, where:

- f_{offset} is the separation between the carrier frequency and the centre of the measurement filter:
- $f_{\text{offset}_{\text{max}}}$ is either 4.0 MHz or the offset to the universal mobile telecommunication system (UMTS) transmit band edge, whichever is the greater.

– Δf_{max} is equal to $f_{offset,max}$ minus half of the bandwidth of the measuring filter.

The spectrum emissions measured should not exceed the maximum level specified in Tables 41A to 41C for the appropriate BS rated output power.

TABLE 41A

Spectrum emission mask values, BS maximum output power $P \geq 34$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$0.8 \text{ MHz} \leq \Delta f < 1.0 \text{ MHz}$	$0.815 \text{ MHz} \leq f_{offset} < 1.015 \text{ MHz}$	–18.5 dBm	30 kHz
$1.0 \text{ MHz} \leq \Delta f < 1.8 \text{ MHz}$	$1.015 \text{ MHz} \leq f_{offset} < 1.815 \text{ MHz}$	$-18.5 \text{ dBm} - 10 \cdot \left(\frac{f_{offset}}{\text{MHz}} - 1.015 \right) \text{ dB}$	30 kHz
(See Note 1)	$1.815 \text{ MHz} \leq f_{offset} < 2.3 \text{ MHz}$	–26.5 dBm	30 kHz
$1.8 \text{ MHz} \leq \Delta f \leq \Delta f_{max}$	$2.3 \text{ MHz} \leq f_{offset} < f_{offset,max}$	–11.5 dBm	1 MHz

TABLE 41B

Spectrum emission mask values, BS maximum output power $26 \leq P < 34$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$0.8 \text{ MHz} \leq \Delta f < 1.0 \text{ MHz}$	$0.815 \text{ MHz} \leq f_{offset} < 1.015 \text{ MHz}$	$P - 52.5 \text{ dB}$	30 kHz
$1.0 \text{ MHz} \leq \Delta f < 1.8 \text{ MHz}$	$1.015 \text{ MHz} \leq f_{offset} < 1.815 \text{ MHz}$	$P - 52.5 \text{ dBm} - 10 \cdot \left(\frac{f_{offset}}{\text{MHz}} - 1.015 \right) \text{ dB}$	30 kHz
(See Note 1)	$1.815 \text{ MHz} \leq f_{offset} < 2.3 \text{ MHz}$	$P - 60.5 \text{ dB}$	30 kHz
$1.8 \text{ MHz} \leq \Delta f \leq \Delta f_{max}$	$2.3 \text{ MHz} \leq f_{offset} < f_{offset,max}$	$P - 45.5 \text{ dB}$	1 MHz

TABLE 41C

Spectrum emission mask values, BS maximum output power $P < 26$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$0.8 \text{ MHz} \leq \Delta f < 1.0 \text{ MHz}$	$0.815 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$	–26.5 dBm	30 kHz
$1.0 \text{ MHz} \leq \Delta f < 1.8 \text{ MHz}$	$1.015 \text{ MHz} \leq f_{\text{offset}} < 1.815 \text{ MHz}$	$-26.5 \text{ dBm} - 10 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 1.015 \right) \text{ dB}$	30 kHz
(See Note 1)	$1.815 \text{ MHz} \leq f_{\text{offset}} < 2.3 \text{ MHz}$	–34.5 dBm	30 kHz
$1.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$2.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–19.5 dBm	1 MHz

NOTE 1 – This frequency range ensures that the range of values of f_{offset} is continuous.

2.3 UTRA 7.68 Mchip/s TDD option

The spectrum emission mask specifies the limit of the transmitter OoB emissions at frequency offsets from the assigned channel frequency of the wanted signal between 5 MHz and 25 MHz.

The requirement should be met by a BS transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions should not exceed the maximum level specified in Tables 42A to 44D in the frequency range of f_{offset} from 5.015 MHz to Δf_{max} from the carrier frequency, where:

- f_{offset} is the separation between the carrier frequency and the centre of the measurement filter:
- $f_{\text{offset}_{\text{max}}}$ is either 25 MHz or the offset to the universal mobile telecommunications system (UMTS) transmit band edge, whichever is the greater.
- Δf_{max} is equal to $f_{\text{offset}_{\text{max}}}$ minus half of the bandwidth of the measuring filter.

The spectrum emissions measured should not exceed the maximum level specified in Tables 42A to 42D for the appropriate BS rated output power.

TABLE 42A

Spectrum emission mask values, BS maximum output power $P \geq 43$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$5 \text{ MHz} \leq \Delta f < 5.2 \text{ MHz}$	$5.015 \text{ MHz} \leq f_{\text{offset}} < 5.215 \text{ MHz}$	–15.5 dBm	30 kHz
$5.2 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$5.215 \text{ MHz} \leq f_{\text{offset}} < 6.015 \text{ MHz}$	$-15.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 5.215 \right) \text{ dB}$	30 kHz
(See Note 1)	$6.015 \text{ MHz} \leq f_{\text{offset}} < 6.5 \text{ MHz}$	–27.5 dBm	30 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–14.5 dBm	1 MHz

TABLE 42B

Spectrum emission mask values, BS maximum output power $39 \leq P < 43$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$5 \text{ MHz} \leq \Delta f < 5.2 \text{ MHz}$	$5.015 \text{ MHz} \leq f_{\text{offset}} < 5.215 \text{ MHz}$	–15.5 dBm	30 kHz
$5.2 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$5.215 \text{ MHz} \leq f_{\text{offset}} < 6.015 \text{ MHz}$	$-15.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 5.215 \right) \text{ dB}$	30 kHz
(See Note 1)	$6.015 \text{ MHz} \leq f_{\text{offset}} < 6.5 \text{ MHz}$	–27.5 dBm	30 kHz
$6 \text{ MHz} \leq \Delta f < 15 \text{ MHz}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < 15.5 \text{ MHz}$	–14.5 dBm	1 MHz
$15 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$15.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 57.5 \text{ dB}$	1 MHz

TABLE 42C

Spectrum emission mask values, BS maximum output power $31 \leq P < 39$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$5 \text{ MHz} \leq \Delta f < 5.2 \text{ MHz}$	$5.015 \text{ MHz} \leq f_{\text{offset}} < 5.215 \text{ MHz}$	$P - 54.5 \text{ dB}$	30 kHz
$5.2 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$5.215 \text{ MHz} \leq f_{\text{offset}} < 6.015 \text{ MHz}$	$P - 54.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 5.215 \right) \text{ dB}$	30 kHz
(See Note 1)	$6.015 \text{ MHz} \leq f_{\text{offset}} < 6.5 \text{ MHz}$	$P - 66.5 \text{ dB}$	30 kHz
$6 \text{ MHz} \leq \Delta f < 15 \text{ MHz}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < 15.5 \text{ MHz}$	$P - 53.5 \text{ dB}$	1 MHz
$15 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$15.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$P - 57.5 \text{ dB}$	1 MHz

TABLE 42D

Spectrum emission mask values, BS maximum output power $P < 31$ dBm

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Maximum level	Measurement bandwidth
$5 \text{ MHz} \leq \Delta f < 5.2 \text{ MHz}$	$5.015 \text{ MHz} \leq f_{\text{offset}} < 5.215 \text{ MHz}$	–23.5 dBm	30 kHz
$5.2 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$5.215 \text{ MHz} \leq f_{\text{offset}} < 6.015 \text{ MHz}$	$-23.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 5.215 \right) \text{ dB}$	30 kHz
(See Note 1)	$6.015 \text{ MHz} \leq f_{\text{offset}} < 6.5 \text{ MHz}$	–35.5 dBm	30 kHz
$6 \text{ MHz} \leq \Delta f < 15 \text{ MHz}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < 15.5 \text{ MHz}$	–22.5 dBm	1 MHz
$15 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$15.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–26.5 dBm	1 MHz

NOTE 1 – This frequency range ensures that the range of values of f_{offset} is continuous.

2.4 E-UTRA (LTE) spectrum mask

The operating band unwanted emission limits are defined from 10 MHz below the lowest frequency of the BS transmitter operating band up to 10 MHz above the highest frequency of the BS transmitter operating band.

The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier) and for all transmission modes foreseen by the manufacturer's specification.

The unwanted emission limits in the part of the operating band that falls in the spurious domain are consistent with Recommendation ITU-R SM.329.

For Wide Area BS, the requirements of either § 2.4.1 (Category A limits) or § 2.4.2 (Category B limits) shall apply.

For Local Area BS, the requirements of § 2.4.3 shall apply (Category A and B).

For Home BS, the requirements of § 2.4.4 shall apply (Category A and B).

Emissions should not exceed the maximum level specified in tables below, where:

- Δf is the separation between the channel edge frequency and the nominal –3 dB point of the measuring filter closest to the carrier frequency.
- f_{offset} is the separation between the channel edge frequency and the centre of the measuring filter.
- $f_{\text{offset}_{\text{max}}}$ is the offset to the frequency 10 MHz outside the BS transmitter operating band.
- Δf_{max} is equal to $f_{\text{offset}_{\text{max}}}$ minus half of the bandwidth of the measuring filter.

For a multi-carrier E-UTRA BS, the definitions above apply to the lower edge of the carrier transmitted at the lowest carrier frequency and the higher edge of the carrier transmitted at the highest carrier frequency.

The requirements of either § 2.4.1 or § 2.4.2 shall apply.

The additional operating band unwanted emission limits defined in § 2.4.2.1 may be mandatory in certain regions. In other regions it may not apply.

2.4.1 E-UTRA spectrum mask (Category A)

For E-UTRA BS operating in Bands 33, 34, 35, 36, 37, 38, 39, 40, 41, emissions shall not exceed the maximum levels specified in Table 43Aa to 43Ac:

For E-UTRA BS operating in Bands 42, 43, emissions shall not exceed the maximum levels specified in Table 43Ad to 43Af:

TABLE 43A

a) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category A

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.5 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-9.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$2.85 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}}$	-13 dBm	1 MHz

b) General operating band unwanted emission limits for 3 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category A

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-13.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm	1 MHz

c) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category A

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.5 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-12.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-13 dBm (Note 3)	1 MHz

TABLE 43A (end)

d) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.8 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	–9.2 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm	1 MHz

e) General operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.2 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–13.2 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm	1 MHz

f) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category A

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.2 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–12.2 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm (Note 3)	1 MHz

2.4.2 E-UTRA spectrum mask (Category B, Option 1)

For E-UTRA BS operating in Bands 33, 34, 35, 36, 37, 38, 39, 40, emissions shall not exceed the maximum levels specified in Table 43Ba to 43Bc:

For E-UTRA BS operating in Bands 42, 43, emissions shall not exceed the maximum levels specified in Table 43Ad to 43Af:

TABLE 43B

a) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.5 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	–9.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm	1 MHz

b) General operating band unwanted emission limits for 3 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–13.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm	1 MHz

c) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (1 GHz < E-UTRA bands ≤ 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.5 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–12.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm (Note 3)	1 MHz

TABLE 43B (end)

d) General operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$+0.8 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	–9.2 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm	1 MHz

e) General operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-3.2 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–13.2 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm	1 MHz

f) General operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands > 3 GHz) for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-5.2 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–13.2 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm (Note 3)	1 MHz

2.4.2a E-UTRA spectrum mask for Wide Area BS (Category B, Option 2)

The limits in this subclause are intended for Europe and may be applied regionally for BS operating in Bands 33 or 34.

For an E-UTRA BS operating in Band 33 or 34, emissions shall not exceed the maximum levels specified in Tables 43BAa to 43BAc).

TABLE 43BA

a) Regional operating band unwanted emission limits in Bands 33 or 34 for 5, 10, 15 and 20 MHz channel bandwidth for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 0.2 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.215 \text{ MHz}$	–12.5 dBm	30 kHz
$0.2 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.215 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$	$-12.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.215 \right) \text{ dB}$	30 kHz
(Note 2)	$1.015 \text{ MHz} \leq f_{\text{offset}} < 1.5 \text{ MHz}$	–24.5 dBm	30 kHz
$1 \text{ MHz} \leq \Delta f \leq \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$1.5 \text{ MHz} \leq f_{\text{offset}} < \min(10.5 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–11.5 dBm	1 MHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm (Note 3)	1 MHz

b) Regional operating band unwanted emission limits in Bands 33 or 34 for 3 MHz channel bandwidth for Category B

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 0.05 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.065 \text{ MHz}$	$6.5 \text{ dBm} - 60 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.015 \right) \text{ dB}$	30 kHz
$0.05 \text{ MHz} \leq \Delta f < 0.15 \text{ MHz}$	$0.065 \text{ MHz} \leq f_{\text{offset}} < 0.165 \text{ MHz}$	$3.5 \text{ dBm} - 160 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.065 \right) \text{ dB}$	30 kHz
$0.15 \text{ MHz} \leq \Delta f < 0.2 \text{ MHz}$	$0.165 \text{ MHz} \leq f_{\text{offset}} < 0.215 \text{ MHz}$	–12.5 dBm	30 kHz
$0.2 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.215 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$	$-12.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.215 \right) \text{ dB}$	30 kHz
(Note 2)	$1.015 \text{ MHz} \leq f_{\text{offset}} < 1.5 \text{ MHz}$	–24.5 dBm	30 kHz
$1 \text{ MHz} \leq \Delta f \leq 6 \text{ MHz}$	$1.5 \text{ MHz} \leq f_{\text{offset}} < 6.5 \text{ MHz}$	–11.5 dBm	1 MHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–15 dBm	1 MHz

TABLE 43BA (end)

**c) Regional operating band unwanted emission limits in Bands 33 or 34
for 1.4 MHz channel bandwidth for Category B**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 0.05 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.065 \text{ MHz}$	$6.5 \text{ dBm} - 60 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.015 \right) \text{ dB}$	30 kHz
$0.05 \text{ MHz} \leq \Delta f < 0.15 \text{ MHz}$	$0.065 \text{ MHz} \leq f_{\text{offset}} < 0.165 \text{ MHz}$	$3.5 \text{ dBm} - 160 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.065 \right) \text{ dB}$	30 kHz
$0.15 \text{ MHz} \leq \Delta f < 0.2 \text{ MHz}$	$0.165 \text{ MHz} \leq f_{\text{offset}} < 0.215 \text{ MHz}$	-12.5 dBm	30 kHz
$0.2 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.215 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$	$-12.5 \text{ dBm} - 15 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.215 \right) \text{ dB}$	30 kHz
(Note 2)	$1.015 \text{ MHz} \leq f_{\text{offset}} < 1.5 \text{ MHz}$	-24.5 dBm	30 kHz
$1 \text{ MHz} \leq \Delta f \leq 2.8 \text{ MHz}$	$1.5 \text{ MHz} \leq f_{\text{offset}} < 3.3 \text{ MHz}$	-11.5 dBm	1 MHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-15 dBm	1 MHz

2.4.3 E-UTRA spectrum mask for local area BS (Category A and B)

For Local Area BS in E-UTRA bands ≤ 3 GHz, emissions shall not exceed the maximum levels specified in Tables 43Ca) to 43Cc).

For Local Area BS in E-UTRA bands > 3 GHz emissions shall not exceed the maximum levels specified in Tables 4d) to 4f).

TABLE 43C

**a) Local area BS operating band unwanted emission limits for 1.4 MHz channel
bandwidth (E-UTRA bands ≤ 3 GHz)**

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-19.5 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-29.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$2.85 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-31 dBm	100 kHz

TABLE 43C (continued)

b) Local area BS operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands ≤ 3 GHz)

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-23.5 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-33.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-35 dBm	100 kHz

c) Local area BS operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands ≤ 3 GHz)

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-28.5 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-35.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-37 dBm (Note 3)	100 kHz

d) Local Area BS operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands > 3 GHz)

Frequency offset of measurement filter -3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-19.2 \text{ dBm} - \frac{10}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-29.2 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$2.85 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-31 dBm	100 kHz

TABLE 43C (end)

e) Local Area BS operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands > 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-23.2 \text{ dBm} - \frac{10}{3} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	-33.2 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-35 dBm	100 kHz

f) Local Area BS operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands > 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-28.2 \text{ dBm} - \frac{7}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-35.2 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.05 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-37 dBm (Note 3)	100 kHz

2.4.4 E-UTRA spectrum mask for Home BS (Category A and B)

For Home BS in E-UTRA bands ≤ 3 GHz, emissions shall not exceed the maximum levels specified in Tables 43Da) to 43Dc).

For Home BS in E-UTRA bands > 3 GHz, emissions shall not exceed the maximum levels specified in Tables 43Dd) to 43Df).

TABLE 43D

a) Home BS operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands ≤ 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-28.5 \text{ dBm} + \frac{6}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	-34.5 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 2)	1 MHz

TABLE 43D (continued)

b) Home BS operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands ≤ 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-32.5 \text{ dBm} - 2 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–38.5 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 2)	1 MHz

c) Home BS operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands ≤ 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-34.5 \text{ dBm} - \frac{6}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–40.5 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 2)	1 MHz

d) Home BS operating band unwanted emission limits for 1.4 MHz channel bandwidth (E-UTRA bands > 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 1.4 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 1.45 \text{ MHz}$	$-28.2 \text{ dBm} - \frac{6}{1.4} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$1.4 \text{ MHz} \leq \Delta f < 2.8 \text{ MHz}$	$1.45 \text{ MHz} \leq f_{\text{offset}} < 2.85 \text{ MHz}$	–34.2 dBm	100 kHz
$2.8 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$3.3 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 4)	1 MHz

TABLE 43D (end)

e) Home BS operating band unwanted emission limits for 3 MHz channel bandwidth (E-UTRA bands > 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 3 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 3.05 \text{ MHz}$	$-32.2 \text{ dBm} - 2 \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$3 \text{ MHz} \leq \Delta f < 6 \text{ MHz}$	$3.05 \text{ MHz} \leq f_{\text{offset}} < 6.05 \text{ MHz}$	–38.2 dBm	100 kHz
$6 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$6.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 4)	1 MHz

f) Home BS operating band unwanted emission limits for 5, 10, 15 and 20 MHz channel bandwidth (E-UTRA bands > 3 GHz)

Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Minimum requirement	Measurement bandwidth (Note 1)
$0 \text{ MHz} \leq \Delta f < 5 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 5.05 \text{ MHz}$	$-34.2 \text{ dBm} - \frac{6}{5} \cdot \left(\frac{f_{\text{offset}}}{\text{MHz}} - 0.05 \right) \text{ dB}$	100 kHz
$5 \text{ MHz} \leq \Delta f < \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$5.05 \text{ MHz} \leq f_{\text{offset}} < \min(10.05 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	–40.2 dBm	100 kHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	$\begin{cases} P - 52 \text{ dB}, 2 \text{ dBm} \leq P \leq 20 \text{ dBm} \\ -50 \text{ dBm}, P < 2 \text{ dBm} \end{cases}$ (Note 3, Note 4)	1 MHz

2.4.5 E-UTRA spectrum mask (additional limits)

The following requirements may apply in certain regions. For E-UTRA BS operating Bands 35, 36 and 41 emissions shall not exceed the maximum levels specified in Table 43E.

TABLE 43E

Additional operating band unwanted emission limits for E-UTRA bands > 1 GHz

Channel bandwidth	Frequency offset of measurement filter –3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_{offset}	Test requirement	Measurement bandwidth (Note 1)
1.4 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.005 \text{ MHz} \leq f_{\text{offset}} < 0.995 \text{ MHz}$	–14 dBm	10 kHz
3 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.985 \text{ MHz}$	–13 dBm	30 kHz
5 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.985 \text{ MHz}$	–15 dBm	30 kHz
10 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	–13 dBm	100 kHz
15 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	–15 dBm	100 kHz
20 MHz	$0 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.05 \text{ MHz} \leq f_{\text{offset}} < 0.95 \text{ MHz}$	–16 dBm	100 kHz
All	$1 \text{ MHz} \leq \Delta f < \Delta f_{\text{max}}$	$1.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	–13 dBm	1 MHz

The following notes are common to all subclauses in § 2.4:

NOTE 1 – As a general rule for the requirements in § 2.4, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

NOTE 2 – This frequency range ensures that the range of values of f_{offset} is continuous.

NOTE 3 – The requirement is not applicable when $\Delta f_{\text{max}} < 10 \text{ MHz}$.

NOTE 4 – For Home BS, the parameter P is defined as the aggregated maximum power of all transmit antenna ports of Home BS.

3 ACLR

ACLR is the ratio of the transmitted power to the power measured after a receiver filter in the adjacent channel(s).

3.1 ACLR for UTRA

For UTRA, both the transmitted power and the received power are measured through a matched filter (root raised cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements should apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

The ACLR of a single carrier BS or a multi-carrier BS with contiguous carrier frequencies should be higher than the value specified in Tables 44Aa) to 44Ac).

TABLE 44A

a) BS ACLR limits for 3.84 Mchip/s TDD option

BS adjacent channel offset below the first or above the last carrier frequency used (MHz)	ACLR limit (dB)
5	44.2
10	54.2

b) BS ACLR limits for 1.28 Mchip/s TDD option

BS adjacent channel offset below the first or above the last carrier frequency used (MHz)	ACLR limit (dB)
1.6	39.2
3.2	44.2

c) BS ACLR limits for 7.68 Mchip/s TDD option

BS adjacent channel offset below the first or above the last carrier frequency used (MHz)	ACLR limit (dB)
10.0	44.2
20.0	54.2

If a BS provides multiple non-contiguous single carriers or multiple non-contiguous groups of contiguous single carriers, the above requirements should be applied individually to the single carriers or group of single carriers.

3.2 ACLR for E-UTRA (LTE)

The ACLR is defined with a square filter of bandwidth equal to the transmission bandwidth configuration of the transmitted signal (BW_{config}) centred on the assigned channel frequency and a filter centred on the adjacent channel frequency according to the tables below. The transmission bandwidth configuration is as specified in Table 44B.

TABLE 44B

Downlink transmission bandwidth configuration BW_{config}

Channel bandwidth $BW_{channel}$ (MHz)	1.4	3	5	10	15	20
Transmission bandwidth configuration (BW_{config}) (MHz)	1.095	2.715	4.515	9.015	13.515	18.015

For Category A Wide Area BS, limits in the tables below or the absolute limit of -13 dBm/MHz apply, whichever is less stringent.

For Category B Wide Area BS, either the ACLR limits in the tables below or the absolute limit of -15 dBm/MHz apply, whichever is less stringent.

For Local Area BS, either the ACLR limits in the tables below or the absolute limit of -32 dBm/MHz shall apply, whichever is less stringent.

For Home BS, either the ACLR limits in the tables below or the absolute limit of -50 dBm/MHz apply, whichever is less stringent.

For operation in unpaired spectrum, the ACLR shall be higher than the value specified in Table 44C.

TABLE 44C

Base station ACLR in unpaired spectrum with synchronized operation

Channel bandwidth of E-UTRA lowest (highest) carrier transmitted $BW_{channel}$ (MHz)	BS adjacent channel centre frequency offset below the lowest or above the highest carrier centre frequency transmitted	Assumed adjacent channel carrier (informative)	Filter on the adjacent channel frequency and corresponding filter bandwidth	ACLR limit
1.4, 3.0	$BW_{channel}$	E-UTRA of same BW	Square (BW_{config})	44.2 dB
	$2 \times BW_{channel}$	E-UTRA of same BW	Square (BW_{config})	44.2 dB
	$BW_{channel}/2 + 0.8$ MHz	1.28 Mchip/s UTRA	RRC (1.28 Mchip/s)	44.2 dB
	$BW_{channel}/2 + 2.4$ MHz	1.28 Mchip/s UTRA	RRC (1.28 Mchip/s)	44.2 dB
5, 10, 15, 20	$BW_{channel}$	E-UTRA of same BW	Square (BW_{config})	44.2 dB
	$2 \times BW_{channel}$	E-UTRA of same BW	Square (BW_{config})	44.2 dB
	$BW_{channel}/2 + 0.8$ MHz	1.28 Mchip/s UTRA	RRC (1.28 Mchip/s)	44.2 dB
	$BW_{channel}/2 + 2.4$ MHz	1.28 Mchip/s UTRA	RRC (1.28 Mchip/s)	44.2 dB
	$BW_{channel}/2 + 2.5$ MHz	3.84 Mchip/s UTRA	RRC (3.84 Mchip/s)	44.2 dB
	$BW_{channel}/2 + 7.5$ MHz	3.84 Mchip/s UTRA	RRC (3.84 Mchip/s)	44.2 dB
	$BW_{channel}/2 + 5$ MHz	7.68 Mchip/s UTRA	RRC (7.68 Mchip/s)	44.2 dB
	$BW_{channel}/2 + 15$ MHz	7.68 Mchip/s UTRA	RRC (7.68 Mchip/s)	44.2 dB

NOTE 1 – $BW_{channel}$ and BW_{config} are the channel bandwidth and transmission bandwidth configuration of the E-UTRA transmitted signal on the assigned channel frequency.

NOTE 2 – The RRC filter shall be equivalent to the transmit pulse shape filter defined in a 3GPP specification, with a chip rate as defined in Table 44C.

4 Transmitter spurious emission (conducted)

The conducted spurious emissions are measured at the BS RF output port.

Unless otherwise stated, all requirements are measured as mean power.

The requirements should apply to BS intended for general-purpose applications.

The requirements should apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer.

For the 3.84 Mchip/s UTRA TDD option, either requirement (except the case of coexistence with PHS) applies at frequencies within the specified frequency ranges which are more than 12.5 MHz under the first carrier frequency used or more than 12.5 MHz above the last carrier frequency used.

For the 1.28 Mchip/s UTRA TDD option, either requirement applies at frequencies within the specified frequency ranges which are more than 4 MHz under the first carrier frequency used or more than 4 MHz above the last carrier frequency used.

For the 7.68 Mchip/s UTRA TDD option, either requirement (except the case of coexistence with PHS) applies at frequencies within the specified frequency ranges which are more than 25 MHz under the first carrier frequency used or more than 25 MHz above the last carrier frequency used.

For E-UTRA (LTE), the requirement applies at frequencies within the specified frequency ranges, excluding the frequency range from 10 MHz below the lowest frequency of the BS transmitter operating band up to 10 MHz above the highest frequency of the BS transmitter operating band.

In areas where Category A limits for spurious emissions, as defined in Recommendation ITU-R SM.329, are applied, the power of any spurious emission should not exceed the maximum levels given in Table 45A.

TABLE 45A
BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement bandwidth	Note
9-150 kHz	-13 dBm	1 kHz	Bandwidth as in Recommendation ITU-R SM.329, § 4.1
150 kHz-30 MHz		10 kHz	Bandwidth as in Recommendation ITU-R SM.329, § 4.1
30 MHz-1 GHz		100 kHz	Bandwidth as in Recommendation ITU-R SM.329, § 4.1
1-12.75 GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329, § 2.5 Table 1

NOTE 1 – The requirements reported in the present table are applicable for the 3.84 Mchip/s, 1.28 Mchip/s, 7.68 Mchip/s and E-UTRA(LTE) TDD options.

In areas where Category B limits for spurious emissions, as defined in Recommendation ITU-R SM.329, are applied, the power of any spurious emission should not exceed the maximum levels given in Tables 45B to 45E.

TABLE 45B
BS spurious emission limits for UTRA 3.84 Mchip/s option, Category B

Band	Maximum level	Measurement bandwidth	Notes
9 ↔ 150 kHz	-36 dBm	1 kHz	(1)
150 kHz ↔ 30 MHz	-36 dBm	10 kHz	(1)
30 MHz ↔ 1 GHz	-36 dBm	100 kHz	(1)
1 GHz ↔ Fl – 10 MHz	-30 dBm	1 MHz	(1)
Fl – 10 MHz ↔ Fu + 10 MHz	-15 dBm	1 MHz	(2)
Fu + 10 MHz ↔ 12.75 GHz	-30 dBm	1 MHz	(3)

TABLE 45C

BS spurious emission limits for UTRA 1.28 Mchip/s option, Category B

Band	Maximum level	Measurement bandwidth	Notes
9 ↔ 150 kHz	−36 dBm	1 kHz	(1)
150 kHz ↔ 30 MHz	−36 dBm	10 kHz	(1)
30 MHz ↔ 1 GHz	−36 dBm	100 kHz	(1)
1 GHz ↔ Flow − 10 MHz	−30 dBm	1 MHz	(1)
$F_{low} - 10 \text{ MHz} \leftrightarrow F_{high} + 10 \text{ MHz}$	−15 dBm	1 MHz	(2)
$F_{high} + 10 \text{ MHz} \leftrightarrow 12.75 \text{ GHz}$	−30 dBm	1 MHz	(3)

TABLE 45D

BS spurious emission limits for UTRA 7.68 Mchip/s option, Category B

Band	Maximum level	Measurement bandwidth	Notes
9 ↔ 150 kHz	−36 dBm	1 kHz	(1)
150 kHz ↔ 30 MHz	−36 dBm	10 kHz	(1)
30 MHz ↔ 1 GHz	−36 dBm	100 kHz	(1)
1 GHz ↔ $F_{low} - 10 \text{ MHz}$	−30 dBm	1 MHz	(1)
$F_{low} - 10 \text{ MHz} \leftrightarrow F_{high} + 10 \text{ MHz}$	−15 dBm	1 MHz	(2)
$F_{high} + 10 \text{ MHz} \leftrightarrow 12.75 \text{ GHz}$	−30 dBm	1 MHz	(3)

(1) Bandwidth as in Recommendation ITU-R SM.329, § 4.1.

(2) Specification in accordance with Recommendation ITU-R SM.329, § 4.3 and Annex 7.

(3) Bandwidth as in Recommendation ITU-R SM.329, § 4.3 and Annex 7. Upper frequency as in Recommendation ITU-R SM.329, § 2.5, Table 1.

F_{low} : Lowest downlink frequency of the operating band.

F_{high} : Highest downlink frequency of the operating band.

TABLE 45E

BS spurious emission limits for E-UTRA, Category B

Band	Maximum level	Measurement bandwidth	Note
9 ↔ 150 kHz	−36 dBm	1 kHz	(1)
150 kHz ↔ 30 MHz	−36 dBm	10 kHz	(1)
30 MHz ↔ 1 GHz	−36 dBm	100 kHz	(1)
1 GHz ↔ 12.75 GHz	−30 dBm	1 MHz	(2)
12.75 GHz ↔ 5 th harmonic of the upper frequency edge of the DL operating band in GHz	−30 dBm	1 MHz	(2), (3)

Notes to Table 45E:

- (1) Bandwidth as in Recommendation ITU-R SM.329, § 4.1.
 (2) Bandwidth as in Recommendation ITU-R SM.329, § 4.1. Upper frequency as in Recommendation ITU-R SM.329, § 2.5 Table 1.
 (3) Applies only for E-UTRA Band 42 and E-UTRA Band 43.

4.1 Coexistence with GSM 900

This requirement may be applied for the protection of GSM 900 MS and GSM 900 BTS receivers in geographic areas in which both GSM 900 and UTRA are deployed.

TABLE 46A

BS spurious emissions limits for UTRA BS in geographic coverage area of GSM 900 MS and GSM 900 BTS receivers

Band	Maximum level	Measurement bandwidth	Note
876-915 MHz	-61 dBm	100 kHz	
921-960 MHz	-57 dBm	100 kHz	

This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.

The power of any spurious emission shall not exceed the maximum level given in Table 46B.

TABLE 46B

BS Spurious emissions limits for protection of the co-located GSM 900 BTS receiver

Band	Maximum level	Measurement bandwidth	Note
876 MHz-915 MHz	-98 dBm	100 kHz	

4.2 Coexistence with DCS 1800

This requirement may be applied for the protection of DCS 1800 MS and DCS 1800 BTS receivers in geographic areas in which both DCS 1800 and UTRA are deployed.

TABLE 46C

a) BS spurious emissions limits for UTRA BS in the band a), d) and e) when operating in geographic coverage area of DCS 1800 MS and DCS 1800 BTS receivers

Band	Maximum level	Measurement bandwidth	Note
1 710-1 785 MHz	-61 dBm	100 kHz	
1 805-1 880 MHz	-47 dBm	100 kHz	

b) BS spurious emissions limits for UTRA BS in the Band f) when operating in geographic coverage area of DCS 1800 MS and DCS 1800 BTS receiver operating in 1 710-1 755 MHz/1 805-1 850 MHz

Band	Maximum level	Measurement bandwidth	Note
1 710-1 755 MHz	-61 dBm	100 kHz	
1 805-1 850 MHz	-47 dBm	100 kHz	

This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.

The power of any spurious emission shall not exceed the maximum level given in Table 46D.

TABLE 46D

a) BS spurious emissions limits for UTRA BS in the Bands a), d) and e) when co-located with DCS 1800 BTS

Band	Maximum level	Measurement bandwidth	Note
1 710 MHz-1 785 MHz	-98 dBm	100 kHz	

b) BS spurious emissions limits for BS in the band f) when co-located with DCS1800 BTS

Band	Maximum level	Measurement bandwidth	Note
1 710 MHz-1 755 MHz	-98 dBm	100 kHz	

4.3 Coexistence with UTRA-FDD

4.3.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD operating in bands specified in Table 46E are deployed.

For TDD base stations which use carrier frequencies within the band 2 010-2 025 MHz the requirements apply at all frequencies within the specified frequency bands in Table 46E. For the 3.84 Mchip/s TDD option base stations which use a carrier frequency within the band 1 900-1 920 MHz, the requirement apply at frequencies within the specified frequency range which are more than 12.5 MHz above the last carrier used in the frequency band 1 900-1 920 MHz. For the 1.28 Mchip/s TDD option base stations which use carrier frequencies within the band 1 900-1 920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 4 MHz above the last carrier used in the frequency band 1 900-1 920 MHz. For the 7.68 Mchip/s TDD option base stations which use a carrier frequency within the band 1 900-1 920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 25 MHz above the last carrier used in the frequency band 1 900-1 920 MHz.

The power of any spurious emission should not exceed values reported in Table 46E.

TABLE 46E

BS spurious emissions limits for UTRA BS in geographic coverage area of UTRA-FDD

BS class	Band	Maximum level	Measurement bandwidth	Note
Wide area BS	1 920-1 980 MHz	-43 dBm ⁽¹⁾	3.84 MHz	
Wide area BS	2 110-2 170 MHz	-52 dBm	1 MHz	
Wide area BS	2 500-2 570 MHz	-43 dBm ⁽²⁾	3.84 MHz	
Wide area BS	2 620-2 690 MHz	-52 dBm	1 MHz	
Wide area BS	815-850 MHz	-43 dBm ⁽³⁾	3.84 MHz	Applicable in Japan
Wide area BS	860-895 MHz	-52 dBm ⁽³⁾	1 MHz	Applicable in Japan
Wide area BS	1 427.9 MHz-1 452.9 MHz	-43 dBm ⁽³⁾	3.84 MHz	Applicable in Japan
Wide area BS	1 475.9 MHz-1 500.9 MHz	-52 dBm ⁽⁴⁾	1 MHz	Applicable in Japan
Wide area BS	1 749.9-1 784.9 MHz	-43 dBm ⁽³⁾	3.84 MHz	Applicable in Japan
Wide area BS	1 844.9-1 879.9 MHz	-52 dBm ⁽³⁾	1 MHz	Applicable in Japan
Local area BS	1 920-1 980 MHz	-40 dBm ⁽¹⁾	3.84 MHz	
Local area BS	2 110-2 170 MHz	-52 dBm	1 MHz	
Local area BS	2 500-2 570 MHz	-40 dBm ⁽²⁾	3.84 MHz	
Local area BS	2 620-2 690 MHz	-52 dBm	1 MHz	

⁽¹⁾ For the 3.84 Mchip/s TDD option base stations which use carrier frequencies within the band 1 900-1 920 MHz, the requirement should be measured RRC filtered mean power with the lowest centre frequency of measurement at 1 922.6 MHz or 15 MHz above the highest TDD carrier used, whichever is higher. For the 1.28 Mchip/s TDD option base stations which use carrier frequencies within the band 1 900-1 920 MHz, the requirement should be measured RRC filtered mean power with the lowest centre frequency of measurement at 1 922.6 MHz or 6.6 MHz above the highest TDD carrier used, whichever is higher. For the 7.68 Mchip/s TDD option base stations which use carrier frequencies within the band 1 900-1 920 MHz, the requirement should be measured RRC filtered mean power with the lowest centre frequency of measurement at 1 922.6 MHz or 30 MHz above the highest TDD carrier used, whichever is higher.

⁽²⁾ For the 3.84 Mchip/s TDD option base stations which use carrier frequencies within the band 2 570-2 620 MHz, the requirement should be measured RRC filtered mean power with the highest centre frequency of measurement at 2 567.5 MHz or 15 MHz below the lowest TDD carrier used, whichever is lower. For the 1.28 Mchip/s TDD option base stations which use carrier frequencies within the band 2 570-2 620 MHz, the requirement should be measured RRC filtered mean power with the highest centre frequency of measurement at 2 567.5 MHz or 6.6 MHz below the lowest TDD carrier used, whichever is lower. For the 7.68 Mchip/s TDD option base stations which use carrier frequencies within the band 2 570-2 620 MHz, the requirement should be measured RRC filtered mean power with the highest centre frequency of measurement at 2 567.5 MHz or 30 MHz below the lowest TDD carrier used, whichever is lower.

⁽³⁾ This is applicable only in Japan for the 3.84 Mchip/s and 7.68 Mchip/s TDD options operating in 2 010-2 025 MHz.

⁽⁴⁾ This is applicable only to the 7.68 Mchip/s TDD option operating in 2 010-2 025 MHz.

The requirements for wide area BS in Table 46E are based on a coupling loss of 67 dB between the TDD and FDD base stations. The requirements for local area BS in Table 46E are based on a coupling loss of 70 dB between TDD and FDD wide area base stations.

4.3.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA TDD BS and UTRA FDD BS are co-located.

For TDD base stations which use carrier frequencies within the band 2 010-2 025 MHz the requirements applies at all frequencies within the specified frequency bands in Table 46F. For 3.84 Mcps TDD option base stations which use a carrier frequency within the band

1 900-1 920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 12.5 MHz above the last carrier used in the frequency band 1 900-1 920 MHz. For 1.28 Mcps TDD option base stations which use carrier frequencies within the band 1 900-1 920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 4 MHz above the last carrier used in the frequency band 1 900-1 920 MHz. For 7.68 Mcps TDD option base stations which use a carrier frequency within the band 1 900-1 920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 25 MHz above the last carrier used in the frequency band 1 900-1 920 MHz.

The power of any spurious emission shall not exceed the maximum level given in Table 46F.

TABLE 46F

BS spurious emissions limits for BS co-located with UTRA FDD

BS class	Band	Maximum level	Measurement bandwidth	Note
Wide Area BS	1 920-1 980 MHz	-80 dBm ⁽¹⁾	3.84 MHz	
Wide Area BS	2 110-2 170 MHz	-52 dBm	1 MHz	
Wide Area BS	2 500-2 570 MHz	-80 dBm ⁽²⁾	3.84 MHz	
Wide Area BS	2 620-2 690 MHz	-52 dBm	1 MHz	

⁽¹⁾ For 3.84 Mcps TDD option base stations which use a carrier frequency within the band 1 900-1 920 MHz or 1 880-1 920 MHz, the requirement shall be measured RRC filtered mean power with the lowest centre frequency of measurement at 1 922.6 MHz or 15 MHz above the highest TDD carrier used, whichever is higher. For 1.28 Mcps TDD option base stations which use a carrier frequency within the band 1 900-1 920 MHz, the requirement shall be measured RRC filtered mean power with the lowest centre frequency of measurement at 1 922.6 MHz or 6.6 MHz above the highest TDD carrier used, whichever is higher. For 7.68 Mcps TDD option base stations which use carrier frequencies within the band 1 900-1 920 MHz, the requirement shall be measured RRC filtered mean power with the lowest centre frequency of measurement at 1 922.6 MHz or 30 MHz above the highest TDD carrier used, whichever is higher.

⁽²⁾ For 3.84 Mcps TDD option base stations which use carrier frequencies within the band 2 570-2 620 MHz, the requirement shall be measured RRC filtered mean power with the highest centre frequency of measurement at 2 567.5 MHz or 15 MHz below the lowest TDD carrier used, whichever is lower.

For 1.28 Mcps TDD option base stations which use carrier frequencies within the band 2 570-2 620 MHz, the requirement shall be measured RRC filtered mean power with the highest centre frequency of measurement at 2 567.5 MHz or 6.6 MHz below the lowest TDD carrier used, whichever is lower.

For 7.68 Mcps TDD option base stations which use carrier frequencies within the band 2 570-2 620 MHz, the requirement shall be measured RRC filtered mean power with the highest centre frequency of measurement at 2 567.5 MHz or 30 MHz below the lowest TDD carrier used, whichever is lower.

The requirements in Table 46F are based on a minimum coupling loss of 30 dB between base stations. The co-location of different base station classes is not considered. A co-location requirement for the Local Area TDD BS is intended to be part of a later release.

4.4 Co-existence of UTRA TDD with unsynchronized UTRA TDD and/or E-UTRA TDD**4.4.1 Operation in the same geographic area**

This requirement may be applied for the protection of TDD BS receivers in geographic areas in which unsynchronized UTRA TDD and/or E-UTRA TDD is deployed.

4.4.1.1 UTRA 3,84 Mcps TDD option

The RRC filtered mean power of any spurious emission shall not exceed the maximum level given in Table 46G.

TABLE 46G

**BS spurious emissions limits for operation in same geographic area with
unsynchronized UTRA TDD and/or E-UTRA TDD**

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-39 dBm	3.84 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-39 dBm	3.84 MHz
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-39 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-36 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-36 dBm	3.84 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-36 dBm	3.84 MHz

The requirements in Table 47G for the Wide Area BS are based on a minimum coupling loss of 67 dB between unsynchronized TDD base stations. The requirements in Table 46G for the Local Area BS are based on a coupling loss of 70 dB between unsynchronized Wide Area and Local Area TDD base stations.

4.4.1.2 1.28 Mcps TDD option

In geographic areas where only 1.28 Mcps TDD is deployed, the RRC filtered mean power of any spurious emission shall not exceed the maximum level given in Table 47H, otherwise the limits in Table 46I shall apply.

TABLE 46H

**BS spurious emissions limits for operation in same geographic area with
unsynchronized 1.28 Mcps UTRA TDD and/or E-UTRA TDD**

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-39 dBm	1.28 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-39 dBm	1.28 MHz
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-39 dBm	1.28 MHz

TABLE 46H (end)

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band e) or E-UTRA Band 40 Wide Area BS	2 300-2 400 MHz	-39 dBm	1.28 MHz
WA UTRA TDD Band f) or E-UTRA Band 39 Wide Area BS	1 880-1 920 MHz	-39 dBm	1.28 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-36 dBm	1.28 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-36 dBm	1.28 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-36 dBm	1.28 MHz
LA UTRA TDD Band e) or E-UTRA Band 40 Local Area BS	2 300-2 400 MHz	-36 dBm	1.28 MHz
LA UTRA TDD Band f) or E-UTRA Band 39 Local Area BS	1 880-1 920 MHz	-36 dBm	1.28 MHz

TABLE 46I

**BS spurious emissions limits for operation in same geographic area with
unsynchronized UTRA TDD and E-UTRA TDD**

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-39 dBm	3.84 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-39 dBm	3.84 MHz
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-39 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-36 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-36 dBm	3.84 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-36 dBm	3.84 MHz

The requirements in Tables 46H and 46I for the Wide Area BS are based on a minimum coupling loss of 67 dB between unsynchronized TDD base stations. The requirements in Tables 46H and 46I for the Local Area BS are based on a coupling loss of 70 dB between unsynchronized Wide Area and Local Area TDD base stations.

4.4.1.3 UTRA 7.68 Mcps TDD option

The RRC filtered mean power of any spurious emission shall not exceed the maximum level given in Tables 46J and 46K.

TABLE 46J

BS spurious emissions limits for operation in same geographic area with unsynchronized UTRA TDD (7.68 Mcps TDD and 3.84 Mcps TDD) and/or E-UTRA TDD

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-39 dBm	3.84 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-39 dBm	3.84 MHz

TABLE 46J (end)

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-39 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-36 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-36 dBm	3.84 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-36 dBm	3.84 MHz

TABLE 46K

**BS spurious emissions limits for operation in same geographic area with
unsynchronized 1.28 Mcps UTRA TDD and/or E-UTRA TDD**

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-39 dBm	1.28 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-39 dBm	1.28 MHz
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-39 dBm	1.28 MHz
WA UTRA TDD Band e) or E-UTRA Band 40 Wide Area BS	2 300-2 400 MHz	-39 dBm	1.28 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-36 dBm	1.28 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-36 dBm	1.28 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-36 dBm	1.28 MHz
LA UTRA TDD Band e) or E-UTRA Band 40 Local Area BS	2 300-2 400 MHz	-36 dBm	1.28 MHz

The requirements in Tables 46J and 46K for the Wide Area BS are based on a minimum coupling loss of 67 dB between unsynchronized TDD base stations. The requirements in Tables 46J and 46K for the Local Area BS are based on a coupling loss of 70 dB between unsynchronized Wide Area and Local Area TDD base stations.

4.4.2 Co-located base stations

This requirement may be applied for the protection of TDD BS receivers when unsynchronized UTRA TDD and/or E-UTRA TDD BS are co-located.

4.4.2.1 3.84 Mcps TDD option

The RRC filtered mean power of any spurious emission shall not exceed the maximum level given in Table 46M.

TABLE 46L

**BS spurious emissions limits for co-location with unsynchronized
UTRA TDD and/or E-UTRA TDD**

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-76 dBm	3.84 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-76 dBm	3.84 MHz
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-76 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-66 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-66 dBm	384 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-66 dBm	3.84 MHz

The requirements in Table 46L for the Wide Area BS are based on a minimum coupling loss of 30 dB between unsynchronized TDD base stations. The requirements in Table 46L for the Local Area BS are based on a minimum coupling loss of 30 dB between unsynchronized Local Area base stations. The co-location of different base station classes is not considered.

4.4.2.2 1.28 Mcps TDD option

In geographic areas where only 1.28 Mcps TDD is deployed, the RRC filtered mean power of any spurious emission in case of co-location shall not exceed the maximum level given in Table 46M, otherwise the limits in Table 46N shall apply.

TABLE 46M

**BS spurious emissions limits for co-location with unsynchronized
1.28 Mcps UTRA TDD and/or E-UTRA TDD**

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-76 dBm	1.28 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-76 dBm	1.28 MHz
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-76 dBm	1.28 MHz

TABLE 46M (*end*)

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band e) or E-UTRA Band 40 Wide Area BS	2 300-2 400 MHz	-76 dBm	1.28 MHz
WA UTRA TDD Band f) or E-UTRA Band 39 Wide Area BS	1 880-1 920 MHz	-76 dBm	1.28 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-71 dBm	1.28 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-71 dBm	1.28 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-71 dBm	1.28 MHz
LA UTRA TDD Band e) or E-UTRA Band 40 Local Area BS	2 300-2 400 MHz	-71 dBm	1.28 MHz
LA UTRA TDD Band f) or E-UTRA Band 39 Local Area BS	1 880-1 920 MHz	-71 dBm	1.28 MHz

NOTE – The requirement applies for frequencies more than 10 MHz below or above the supported frequency range declared by the vendor.

TABLE 46N

**BS spurious emissions limits for co-location with unsynchronized
UTRA TDD and/or E-UTRA TDD**

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-76 dBm	384 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-76 dBm	3.84 MHz
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-76 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-66 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-66 dBm	3.84 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-66 dBm	3.84 MHz

The requirements in Tables 46M and 46N for the Wide Area BS are based on a minimum coupling loss of 30 dB between unsynchronized TDD base stations. The requirements in Tables 46M and 46N for the Local Area BS are based on a minimum coupling loss of 30 dB between unsynchronized Local Area base stations. The co-location of different base station classes is not considered.

4.4.2.3 7.68 Mcps TDD option

The RRC filtered mean power of any spurious emission shall not exceed the maximum level given in Tables 46O and 46P.

TABLE 46O

**BS spurious emissions limits for co-location with unsynchronized UTRA TDD
(7.68 Mcps TDD and 3.84 Mcps TDD) and/or E-UTRA TDD**

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-76 dBm	3.84 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-76 dBm	3.84 MHz
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-76 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-66 dBm	3.84 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-66 dBm	3.84 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-66 dBm	3.84 MHz

TABLE 46P

**BS spurious emissions limits for co-location with unsynchronized
1.28 Mcps UTRA TDD and/or E-UTRA TDD**

System type operating in the same geographic area BS Class	Frequency range band	Maximum level	Measurement bandwidth
WA UTRA TDD Band a) or E-UTRA Band 33 Wide Area BS	1 900-1 920 MHz	-76 dBm	1.28 MHz
WA UTRA TDD Band a) or E-UTRA Band 34 Wide Area BS	2 010-2 025 MHz	-76 dBm	1.28 MHz
WA UTRA TDD Band d) or E-UTRA Band 38 Wide Area BS	2 570-2 620 MHz	-76 dBm	1.28 MHz
WA UTRA TDD Band e) or E-UTRA Band 40 Wide Area BS	2 300-2 400 MHz	-76 dBm	1.28 MHz
LA UTRA TDD Band a) or E-UTRA Band 33 Local Area BS	1 900-1 920 MHz	-71 dBm	1.28 MHz
LA UTRA TDD Band a) or E-UTRA Band 34 Local Area BS	2 010-2 025 MHz	-71 dBm	1.28 MHz
LA UTRA TDD Band d) or E-UTRA Band 38 Local Area BS	2 570-2 620 MHz	-71 dBm	1.28 MHz
LA UTRA TDD Band e) or E-UTRA Band 40 Local Area BS	2 300-2 400 MHz	-71 dBm	1.28 MHz

The requirements in Tables 46O and 46P for the Wide Area BS are based on a minimum coupling loss of 30 dB between unsynchronized TDD base stations. The requirements in Tables 46O and 46P for the Local Area BS are based on a minimum coupling loss of 30 dB between unsynchronized Local Area base stations. The co-location of different base station classes is not considered.

4.5 Coexistence with other systems in the same geographical area for E-UTRA

These requirements may be applied for the protection of UE, MS and/or BS operating in other frequency bands in the same geographical area. The requirements may apply in geographic areas in which both E-UTRA BS and a system operating in another frequency band than the E-UTRA operating band are deployed. The system operating in the other frequency band may be GSM900, DCS1800, PCS1900, GSM850, UTRA FDD/TDD and/or E-UTRA.

The power of any spurious emission shall not exceed the limits of Table 46Q for a BS where requirements for co-existence with the system listed in the first column apply.

TABLE 46Q

**BS spurious emission limits for E-UTRA BS in geographic coverage area
of systems operating in other frequency bands**

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
GSM900	921-960 MHz	-57 dBm	100 kHz	This requirement does not apply to E-UTRA 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 E-UTRA BS operating in Band 8
DCS1800	1 805-1 880 MHz	-47 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in Band 3
	1 710-1 785 MHz	-61 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in Band 3
PCS1900	1 930-1 990 MHz	-47 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in frequency Band 2, Band 25 or Band 36
	1 850-1 910 MHz	-61 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in frequency Band 2 or 25. This requirement does not apply to E-UTRA BS operating in frequency Band 35
GSM850	869-894 MHz	-57 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in frequency Band 5
	824-849 MHz	-61 dBm	100 kHz	This requirement does not apply to E-UTRA BS operating in frequency Band 5
UTRA FDD Band I or E-UTRA Band 1	2 110-2 170 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 1
	1 920-1 980 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 1
UTRA FDD Band II or E-UTRA Band 2	1 930-1 990 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 2 or 25
	1 850-1 910 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 2 or 25
UTRA FDD Band III or E-UTRA Band 3	1 805-1 880 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 3 or 9
	1 710-1 785 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 3. For E-UTRA BS operating in Band 9, this requirement applies for 1 710 MHz to 1 749.9 MHz and 1 784.9 MHz to 1 785 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 E-UTRA BS operating in Band 4 or 10
	1 710-1 755 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 4 or 10

TABLE 46Q (continued)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band V or E-UTRA Band 5	869-894 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 5
	824-849 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 5
UTRA FDD Band VI or XIX or E-UTRA Bands 6, 18, 19	860-895 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Bands 6, 18 or 19
	815-850 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 18
	830-850 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Bands 6, 19
UTRA FDD Band VII or E-UTRA Band 7	2 620-2 690 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 7
	2 500-2 570 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 7
UTRA FDD Band VIII or E-UTRA Band 8	925-960 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 8
	880-915 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA 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 E-UTRA BS operating in Bands 3 or 9
	1 749.9-1 784.9 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA 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 E-UTRA BS operating in Band 4 or 10
	1 710-1 770 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 10. For E-UTRA 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 E-UTRA BS operating in Band 11 or 21
	1 427.9-1 447.9 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 11
	1 447.9-1 462.9 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 21
UTRA FDD Band XII or E-UTRA Band 12	729-746 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 12
	699-716 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 12
UTRA FDD Band XIII or E-UTRA Band 13	746-756 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 13
	777-787 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 13
UTRA FDD Band XIV or E-UTRA Band 14	758-768 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 14
	788-798 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 14

TABLE 46Q (continued)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
E-UTRA Band 17	734-746 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 17
	704-716 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 17
UTRA FDD Band XX or E-UTRA Band 20	791-821 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 20
	832-862 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA 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 E-UTRA BS operating in Band 22 or 42
	3 410-3 490 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 22. This requirement does not apply to E-UTRA BS operating in Band 42
E-UTRA Band 23	2 180-2 200 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 23
	2 000-2 020 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 23. This requirement does not apply to BS operating in Bands 2 or 25, where the limits are defined separately
	2 000-2 010 MHz	-30 dBm	1 MHz	This requirement only applies to E-UTRA BS operating in Band 2 or Band 25. This requirement applies starting 5 MHz above the Band 25 downlink operating band. (Note 4)
	2 010-2 020 MHz	-49 dBm	1 MHz	
E-UTRA Band 24	1 525-1 559 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 24
	1 626.5-1 660.5 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 24
UTRA FDD Band XXV or E-UTRA Band 25	1 930-1 995 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 2 or 25
	1 850-1 915 MHz	-49 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 25. For E-UTRA BS operating in Band 2, it applies for 1910 MHz to 1915 MHz
UTRA TDD Band a) or E-UTRA Band 33	1 900-1 920 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 33
UTRA TDD in Band a) or E-UTRA Band 34	2 010-2 025 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 34

TABLE 46Q (end)

System type operating in the same geographical area	Band for coexistence requirement	Maximum level	Measurement bandwidth	Note
UTRA TDD in Band b) or E-UTRA Band 35	1 850-1 910 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 35
UTRA TDD in Band b) or E-UTRA Band 36	1 930-1 990 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 2 and Band 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 E-UTRA BS operating in Band 37. This unpaired band is defined in Recommendation ITU-R M.1036, but is pending any future deployment
UTRA TDD in Band d) or E-UTRA Band 38	2 570-2 620 MHz	-52 dBm	1 MHz	This requirement does not apply to E-UTRA BS operating in Band 38
UTRA TDD in Band f) or E-UTRA Band 39	1 880-1 920 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 39
UTRA TDD in Band e) or E-UTRA Band 40	2 300-2 400 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 40
E-UTRA Band 41	2 496-2 690 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 41
E-UTRA Band 42	3 400-3 600 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 42 or 43
E-UTRA Band 43	3 600-3 800 MHz	-52 dBm	1 MHz	This is not applicable to E-UTRA BS operating in Band 42 or 43

NOTE 1 – As defined in the scope for spurious emissions in this clause (§ 4), the co-existence requirements in Table 47Q do not apply for the 10 MHz frequency range immediately outside the BS transmit frequency range of an operating band (see Notes 2 and 3 for the scope). This is also the case when the transmit frequency range is adjacent to the band for the co-existence requirement in the table. Emission limits for this excluded frequency range may also be covered by local or regional requirements.

NOTE 2 – The table above assumes that two operating bands, where the frequency ranges defined either in Note 2 or 3 in the scope 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 this Recommendation.

NOTE 3 – 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, special co-existence requirements may apply that are not covered by the 3GPP specifications.

NOTE 4 – This requirement does not apply to a Band 2 E-UTRA BS of an earlier release. In addition, it does not apply to an E-UTRA Band 2 BS from an earlier release manufactured before 31 December 2012, which is upgraded to support Rel-10 features, where the upgrade does not affect existing RF parts of the radio unit related to this requirement.

The power of any spurious emission shall not exceed the limits of Table 46R for a Home BS where requirements for co-existence with a Home BS type listed in the first column apply.

TABLE 46R
**Home BS spurious emissions limits for co-existence with Home BS
operating in other frequency bands**

Type of coexistence BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band I or E-UTRA Band 1	1 920-1 980 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 1
UTRA FDD Band II or E-UTRA Band 2	1 850-1 910 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 2 or 25
UTRA FDD Band III or E-UTRA Band 3	1 710-1 785 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 3. For Home BS operating in Band 9, it applies for 1 710 MHz to 1 749.9 MHz and 1 784.9 MHz to 1 785 MHz
UTRA FDD Band IV or E-UTRA Band 4	1 710-1 755 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 4 or 10
UTRA FDD Band V or E-UTRA Band 5	824-849 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 5
UTRA FDD Band VI, XIX or E-UTRA Bands 6, 18, 19	815-830 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 18. Requirement in subclause 6.6.4.5.3
	830-850 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Bands 6, 19
UTRA FDD Band VII or E-UTRA Band 7	2 500-2 570 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 7
UTRA FDD Band VIII or E-UTRA Band 8	880-915 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 8
UTRA FDD Band IX or E-UTRA Band 9	1 749.9-1 784.9 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 3 or 9
UTRA FDD Band X or E-UTRA Band 10	1 710-1 770 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 10. For Home BS operating in Band 4, it applies for 1 755 MHz to 1 770 MHz

TABLE 46R (continued)

Type of coexistence BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
UTRA FDD Band XI, XXI or E-UTRA Bands 11, 21	1 427.9-1 447.9 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 11
	1 447.9-1 462.9 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 21
UTRA FDD Band XII or E-UTRA Band 12	699-716 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 12
UTRA FDD Band XIII or E-UTRA Band 13	777-787 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 13
UTRA FDD Band XIV or E-UTRA Band 14	788-798 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 14
E-UTRA Band 17	704-716 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 17
UTRA FDD Band XX or E-UTRA Band 20	832-862 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 20
UTRA FDD Band XXII or E-UTRA Band 22	3 410-3 490 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 22. This requirement does not apply to Home BS operating in Band 42
E-UTRA Band 24	1 626.5-1 660.5 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 24
UTRA FDD Band XXV or E-UTRA Band 25	1 850-1 915 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 25
UTRA TDD in Band a) or E-UTRA Band 33	1 900-1 920 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 33
UTRA TDD in Band a) or E-UTRA Band 34	2 010-2 025 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 34
UTRA TDD in Band b) or E-UTRA Band 35	1 850-1 910 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 35
UTRA TDD in Band b) or E-UTRA Band 36	1 930-1 990 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Bands 2 and 36
UTRA TDD in Band c) or E-UTRA Band 37	1 910-1 930 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 37. This unpaired band is defined in Rec. ITU-R M.1036, but is pending any future deployment
UTRA TDD in Band d) or E-UTRA Band 38	2 570-2 620 MHz	-71 dBm	100 kHz	This requirement does not apply to Home BS operating in Band 38
UTRA TDD in Band f) or E-UTRA Band 39	1 880-1 920 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 39

TABLE 46R (*end*)

Type of coexistence BS	Frequency range for co-location requirement	Maximum Level	Measurement Bandwidth	Note
UTRA TDD in Band e) or E-UTRA Band 40	2 300-2 400 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 40
E-UTRA Band 41	2 496-2 690 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 41
E-UTRA Band 42	3 400-3 600 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 42 or 43
E-UTRA Band 43	3 600-3 800 MHz	-71 dBm	100 kHz	This is not applicable to Home BS operating in Band 42 or 43

NOTE 1 – The coexistence requirements in Table 46R do not apply for the 10 MHz frequency range immediately outside the Home BS transmit frequency range of a downlink operating band.

NOTE 2 – The tables above assumes that two operating bands, where the frequency ranges in Table 5 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 this Recommendation.

NOTE 3 – 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, special co-existence requirements may apply that are not covered by this Recommendation.

4.6 Co-location with other base stations for E-UTRA

These requirements may be applied for the protection of other BS receivers when UTRA FDD, UTRA TDD and/or E-UTRA BS are co-located with an E-UTRA 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 46S for a Wide Area BS where requirements for co-location with a BS type listed in the first column apply.

TABLE 46S

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

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
Macro GSM900	876-915 MHz	-98 dBm	100 kHz	
Macro DCS1800	1 710-1 785 MHz	-98 dBm	100 kHz	
Macro PCS1900	1 850-1 910 MHz	-98 dBm	100 kHz	
Macro GSM850	824-849 MHz	-98 dBm	100 kHz	
WA UTRA FDD Band I or E-UTRA Band 1	1 920-1 980 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band II or E-UTRA Band 2	1 850-1 910 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band III or E-UTRA Band 3	1 710-1 785 MHz	-96 dBm	100 kHz	

TABLE 46S (continued)

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
WA UTRA FDD Band IV or E-UTRA Band 4	1 710-1 755 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band V or E-UTRA Band 5	824-849 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VI, XIX or E-UTRA Bands 6, 19	830-845 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VII or E-UTRA Band 7	2 500-2 570 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band VIII or E-UTRA Band 8	880-915 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band IX or E-UTRA Band 9	1 749.9-1 784.9 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band X or E-UTRA Band 10	1 710-1 770 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XI or E-UTRA Band 11	1 427.9-1 447.9 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XII or E-UTRA Band 12	699-716 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XIII or E-UTRA Band 13	777-787 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XIV or E-UTRA Band 14	788-798 MHz	-96 dBm	100 kHz	
WA E-UTRA Band 17	704-716 MHz	-96 dBm	100 kHz	
WA E-UTRA Band 18	815-830 MHz	-96 dBm	100 kHz	
WA E-UTRA Band 20	832-862 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XXI or E-UTRA Band 21	1 447.9-1 462.9 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XXII or E-UTRA Band 22	3 410-3 490 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42
WA E-UTRA Band 23	2 000-2 020 MHz	-96 dBm	100 kHz	
WA E-UTRA Band 24	1 626.5-1 660.5 MHz	-96 dBm	100 kHz	
WA UTRA FDD Band XXV or E-UTRA Band 25	1 850-1 915 MHz	-96 dBm	100 kHz	
WA UTRA TDD in Band a) or E-UTRA Band 33	1 900-1 920 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 33

TABLE 46S (*end*)

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
WA UTRA TDD in Band a) or E-UTRA Band 34	2 010-2 025 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 34
WA UTRA TDD in Band b) or E-UTRA Band 35	1 850-1 910 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 35
WA UTRA TDD in Band b) or E-UTRA Band 36	1 930-1 990 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Bands 2 and 36
WA UTRA TDD in Band c) or E-UTRA Band 37	1 910-1 930 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 37. This unpaired band is defined in Recommendation ITU-R M.1036, but is pending any future deployment
WA UTRA TDD in Band d) or E-UTRA Band 38	2 570-2 620 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 38
WA UTRA TDD Band f) or E-UTRA Band 39	1 880-1 920 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Bands 33 and 39
WA UTRA TDD Band e) or E-UTRA Band 40	2 300-2 400 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 40
WA E-UTRA Band 41	2 496-2 690 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 41
WA E-UTRA Band 42	3 400-3 600 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42 or 43
WA E-UTRA Band 43	3 600-3 800 MHz	-96 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42 or 43

The power of any spurious emission shall not exceed the limits of Table 46T for a Local Area BS where requirements for co-location with a BS type listed in the first column apply.

TABLE 46T

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

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
Pico GSM900	876-915 MHz	-70 dBm	100 kHz	
Pico DCS1800	1 710-1 785 MHz	-80 dBm	100 kHz	
Pico PCS1900	1 850-1 910 MHz	-80 dBm	100 kHz	
Pico GSM850	824-849 MHz	-70 dBm	100 kHz	
LA UTRA FDD Band I or E-UTRA Band 1	1 920-1 980 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band II or E-UTRA Band 2	1 850-1 910 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band III or E-UTRA Band 3	1 710-1 785 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band IV or E-UTRA Band 4	1 710-1 755 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band V or E-UTRA Band 5	824-849 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band VI, XIX or E-UTRA Band 6, 19	830-845 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band VII or E-UTRA Band 7	2 500-2 570 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band VIII or E-UTRA Band 8	880-915 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band IX or E-UTRA Band 9	1 749.9-1 784.9 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band X or E-UTRA Band 10	1 710-1 770 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XI or E-UTRA Band 11	1 427.9-1 447.9 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XII or E-UTRA Band 12	699-716 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XIII or E-UTRA Band 13	777-787 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XIV or E-UTRA Band 14	788-798 MHz	-88 dBm	100 kHz	
LA E-UTRA Band 17	704-716 MHz	-88 dBm	100 kHz	
LA E-UTRA Band 18	815-830 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XX or E-UTRA Band 20	832-862 MHz	-88 dBm	100 kHz	

TABLE 46T (continued)

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
LA UTRA FDD Band XXI or E-UTRA Band 21	1 447.9-1 462.9 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XXII or E-UTRA Band 22	3 410-3 490 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42
LA E-UTRA Band 23	2 000-2 020 MHz	-88 dBm	100 kHz	
LA E-UTRA Band 24	1 626.5-1 660.5 MHz	-88 dBm	100 kHz	
LA UTRA FDD Band XXV or E-UTRA Band 25	1 850-1 915 MHz	-88 dBm	100 kHz	
LA UTRA TDD in Band a) or E-UTRA Band 33	1 900-1 920 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 33
LA UTRA TDD in Band a) or E-UTRA Band 34	2 010-2 025 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 34
LA UTRA TDD in Band b) or E-UTRA Band 35	1 850-1 910 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 35
LA UTRA TDD in Band b) or E-UTRA Band 36	1 930-1 990 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Bands 2 and 36
LA UTRA TDD in Band c) or E-UTRA Band 37	1 910-1 930 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 37. This unpaired band is defined in Recommendation ITU-R M.1036, but is pending any future deployment
LA UTRA TDD in Band d) or E-UTRA Band 38	2 570-2 620 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 38
LA UTRA TDD Band f) or E-UTRA Band 39	1 880-1 920 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Bands 33 and 39
LA UTRA TDD Band e) or E-UTRA Band 40	2 300-2 400 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 40
LA E-UTRA Band 41	2 496-2 690 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 41

TABLE 46T (*end*)

Type of co-located BS	Frequency range for co-location requirement	Maximum level	Measurement bandwidth	Note
LA E-UTRA Band 42	3 400-3 600 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42 or 43
LA E-UTRA Band 43	3 600-3 800 MHz	-88 dBm	100 kHz	This is not applicable to E-UTRA BS operating in Band 42 or 43

NOTE 1 – The co-location requirements in Table 46S and Table 46T do not apply for the 10 MHz 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.

NOTE 2 – The table above assumes that two operating bands, where the corresponding eNode B 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.

NOTE 3 – Co-located TDD base stations that are synchronized and using the same operating band can transmit without special co-locations requirements. For unsynchronized base stations, special co-location requirements may apply.

4.7 Coexistence with PHS

This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA TDD or E-UTRA TDD are deployed. For the 3.84 Mchip/s TDD option, this requirement is also applicable at specified frequencies falling between 12.5 MHz below the first carrier frequency used and 12.5 MHz above the last carrier frequency used. For the 7.68 Mchip/s TDD option, this requirement is also applicable at specified frequencies falling between 25 MHz below the first carrier frequency used and 25 MHz above the last carrier frequency used. For E-UTRA TDD, this requirement is also applicable at specified frequencies falling between 10 MHz below the lowest BS transmitter frequency of the operating band and 10 MHz above the highest BS transmitter frequency of the operating band.

The power of any spurious emission should not exceed values reported in Table 46U.

TABLE 46U

BS spurious emissions limits for UTRA BS (3.84 Mchip/s and 7.68 Mchip/s TDD options) and E-UTRA BS in geographic coverage area of PHS

Band	Maximum level	Measurement bandwidth	Note
1 884.5-1 915.7 MHz	-41 dBm	300 kHz	UTRA TDD: Applicable for transmission in 2 010-2 025 MHz E-UTRA: Applicable when co-existence with PHS system operating in 1 884.5-1 915.7 MHz

5 Receiver spurious emission

The requirements apply to all BS with separate receive and transmit antenna ports. The test should be performed when both transmitter and receiver are on with the transmitter port terminated.

For BS equipped with only a single antenna connector for both transmitter and receiver, the requirements of transmitter spurious emissions should apply to this port, and this test need not be performed.

The requirements in this subclause should apply to BS intended for general-purpose applications.

The power of any spurious emission should not exceed the values given in the Tables below.

For E-UTRA, in addition to the requirements in Table 47F, the power of any spurious emission should not exceed the levels specified for co-existence with other systems in the same geographical area in § 4.5, § 4.7. In addition, the co-existence requirements for co-located base stations specified in § 4.6 may also be applied.

5.1 3.84 Mchip/s UTRA TDD option

TABLE 47A

Receiver spurious emission requirements

Band	Maximum level	Measurement bandwidth	Note
30 MHz-1 GHz	-57 dBm	100 kHz	
1 GHz-1.9 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS
1.900-1.980 GHz	-78 dBm	3.84 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS
1.980-2.010 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS
2.010-2.025 GHz	-78 dBm	3.84 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the BS
2.025-2.500 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the BS
2.500-2.620 GHz	-78 dBm	3,84 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the BS
2.620-12.75 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the BS

TABLE 47B

Additional receiver spurious emission requirements

Band	Maximum level	Measurement bandwidth	Note
815 MHz-850 MHz 1 749.9 MHz-1 784.9 MHz	-78 dBm	3.84 MHz	Applicable in Japan. With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS

5.2 1.28 Mchip/s UTRA TDD option

TABLE 47C

Receiver spurious emission requirements

Band	Maximum level	Measurement bandwidth	Note
30 MHz-1 GHz	-57 dBm	100 kHz	With the exception of frequencies between 4 MHz below the first carrier frequency and 4 MHz above the last carrier frequency used by the BS
1 GHz-12.75 GHz	-47 dBm	1 MHz	

TABLE 47D

Additional spurious emission requirements

Operating band	Band	Maximum level	Measurement bandwidth	Note
a	1 900-1 920 MHz	-83 dBm	1.28 MHz	With the exception of frequencies between 4 MHz below the first carrier frequency and 4 MHz above the last carrier frequency used by the BS.
	2 010-2 025 MHz	-83 dBm	1.28 MHz	
b	1 850-1 910 MHz	-83 dBm	1.28 MHz	
	1 930-1 990 MHz	-83 dBm	1.28 MHz	
c	1 910-1 930 MHz	-83 dBm	1.28 MHz	
d	2 570-2 620 MHz	-83 dBm	1.28 MHz	
e	2 300-2 400 MHz	-83 dBm	1.28 MHz	
f	1 880-1 920 MHz	-83 dBm	1.28 MHz	

In addition, the requirement in Table 47E may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.

TABLE 47E

Additional spurious emission requirements for the FDD bands

Operating band	Protected band	Maximum level	Measurement bandwidth	Note
a, e, f	1 920-1 980 MHz	-78 dBm	3.84 MHz	With the exception of frequencies between 4 MHz below the first carrier frequency and 4 MHz above the last carrier frequency used by the BS.
d, e	2 500-2 570 MHz	-78 dBm	3.84 MHz	

5.3 7.68 Mchip/s UTRA TDD option

TABLE 47F

Receiver spurious emission requirements

Band	Maximum level	Measurement bandwidth	Note
30 MHz-1 GHz	-57 dBm	100 kHz	With the exception of frequencies between 25 MHz below the first carrier frequency and 25 MHz above the last carrier frequency used by the BS
1 GHz-1.9 GHz, 1.98 GHz-2.01 GHz 2.025 GHz-2.5 GHz	-47 dBm	1 MHz	
1.9 GHz-1.98 GHz, 2.01 GHz-2.025 GHz 2.5 GHz-2.62 GHz	-75 dBm	7.68 MHz	
2.62 GHz-12.75 GHz	-47 dBm	1 MHz	

TABLE 47G

Additional receiver spurious emission requirements

Band	Maximum level	Measurement bandwidth	Note
815 MHz-850 MHz 1 427.9 MHz-1 452.9 MHz 1 749.9 MHz-1 784.9 MHz	-78 dBm	3.84 MHz	Applicable in Japan With the exception of frequencies between 25 MHz below the first carrier frequency and 25 MHz above the last carrier frequency used by the BS

5.4 E-UTRA TDD option

TABLE 47H

Receiver spurious emission limits

Band	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 - 5 th harmonic of the upper frequency edge of the UL operating band in GHz	-47 dBm	1 MHz	Applies only for E-UTRA Band 42 and E-UTRA 43.

NOTE 1 – For E-UTRA, the frequency range between $2.5 * BW_{channel}$ below the first carrier frequency and $2.5 * BW_{channel}$ above the last carrier frequency transmitted by the BS, where $BW_{channel}$ is the channel bandwidth, may be excluded from the requirement. However, frequencies that are more than 10 MHz below the lowest frequency of the BS transmitter operating band or more than 10 MHz above the highest frequency of the BS transmitter operating band shall not be excluded from the requirement.

Annex 4

TDMA Single-Carrier (UWC-136) base stations

PART A

Conformance requirements (30 kHz)

1 Spectrum mask

Spectrum noise suppression is the restraint of sideband energy outside the active transmit channel. This RF spectrum is the result of power ramping, modulation and all sources of noise. The spectrum is primarily the result of events that do not occur at the same time: digital modulation and power ramping (switching transients). The RF spectrum from these two events are specified separately.

Adjacent and first or second alternate channel power is that part of the mean power output of the transmitter resulting from the modulation and noise which falls within a specified passband centred on either of the adjacent or first or second alternate channels.

The emission power should not exceed the limits specified in Table 48.

TABLE 48

Adjacent and alternate channel power requirements

Channel	Maximum level
In either adjacent channel, centred ± 30 kHz from the centre frequency	26 dB below the mean output power
In either alternate channel, centred ± 60 kHz from the centre frequency	45 dB below the mean output power
In either second alternate channel centred ± 90 kHz from the centre frequency	45 dB below the mean output power or -13 dBm measured in 30 kHz bandwidth, whichever is the lower power

OoB power arising from switching transients is the peak power of the spectrum, arising from the ramping-on and ramping-off of the transmitter, that fall within defined frequency bands outside the active transmit channel.

The peak emission power should not exceed the limits specified in Table 49.

TABLE 49

Switching transients requirements

Channel	Maximum level
In either adjacent channel, centred ± 30 kHz from the centre frequency	26 dB below the peak output power reference
In either alternate channel, centred ± 60 kHz from the centre frequency	45 dB below the peak output power reference
In either second alternate channel centred ± 90 kHz from the centre frequency	45 dB below the peak output power reference or -13 dBm measured in 30 kHz bandwidth, whichever is the lower power

2 Transmitter spurious emissions (conducted)

The power of any spurious emission should not exceed the limits specified in Table 50.

TABLE 50
Spurious emission limits

Band (f) ⁽¹⁾	Maximum level (dBm)	Measurement bandwidth	Note
$9 \text{ kHz} \leq f \leq 150 \text{ kHz}$	-36	1 kHz	(2)
$150 \text{ kHz} < f \leq 30 \text{ MHz}$	-36	10 kHz	(2)
$30 \text{ MHz} < f \leq 1\,000 \text{ MHz}$	-36	100 kHz	(2)
$1\,000 \text{ MHz} < f < 1\,920 \text{ MHz}$	-30	1 MHz	(2)
$1\,920 \text{ MHz} \leq f \leq 1\,980 \text{ MHz}$	-30	30 kHz	(3)
$1\,980 \text{ MHz} < f < 2\,110 \text{ MHz}$	-30	1 MHz	(2)
$2\,110 \text{ MHz} \leq f \leq 2\,170 \text{ MHz}$	-70	30 kHz	(4)
$2\,170 \text{ MHz} < f \leq 12.75 \text{ GHz}$	-30	1 MHz	(2)

(1) f is the frequency of the spurious emission.

(2) In accordance with the applicable clauses of Recommendation ITU-R SM.329.

(3) MS transmit band.

(4) MS receive band.

2.1 Coexistence with services in adjacent frequency bands

This requirement provides for the protection of receivers operating in bands adjacent to the MS transmit frequency band of 1 920 to 1 980 MHz: GSM 900, R-GSM and UTRA TDD.

NOTE 1 – UTRA FDD operates in the same frequency band as UWC-136.

The power of any spurious emission should not exceed the limits specified in Table 51.

TABLE 51
Additional spurious emissions requirements

Service	Frequency band	Measurement bandwidth (kHz)	Limit (dBm)
R-GSM	$921 \leq f \leq 925 \text{ MHz}$	100	-60
R-GSM	$925 < f \leq 935 \text{ MHz}$	100	-67
GSM 900/R-GSM	$935 < f \leq 960 \text{ MHz}$	100	-79
DCS 1800	$1\,805 \leq f \leq 1\,880 \text{ MHz}$	100	-71
UTRA TDD	$1\,900 \leq f \leq 1\,920 \text{ MHz}$	100	-62
UTRA TDD	$2\,010 \leq f \leq 2\,025 \text{ MHz}$	100	-62

NOTE 1 – The measurements are made on frequencies which are integer multiples of 200 kHz. Up to five exceptions of up to -36 dBm are permitted in the GSM 900, DCS 1800 and UTRA bands, and up to three exceptions of up to -36 dBm are permitted in the GSM 400 bands.

3 Receiver spurious emissions (idle mode)

The power of any spurious emissions should not exceed the limits given in Table 52.

TABLE 52

General receiver spurious emission requirements

Frequency band	Measurement bandwidth	Maximum level (dBm)	Note
$30 \text{ MHz} \leq f < 1 \text{ GHz}$	100 kHz	-57	
$1 \text{ GHz} \leq f \leq 12.75 \text{ GHz}$	1 MHz	-47	With the exception of the frequencies covered by the table below, for which additional receiver spurious emission requirements apply ⁽¹⁾

⁽¹⁾ *Editorial Note* – In TFES Harmonized Standard v1.0.2, no additional receiver spurious emission is specified; yet, it is expected that there will be a table added, in the same form as for the other technologies (see Annexes 1, 2 and 3).

PART B

Conformance requirements (200 kHz)

The 200 kHz channel provides packet data service and employs 8-level phase shift keying (8-PSK), 16-QAM, 32-QAM as well as Gaussian minimum shift keying (GMSK) modulations.

1 Frequency bands and channel arrangement

i) T-GSM 380 band:

- for T-GSM 380, the system is required to operate in the following band:
 - 380.2 MHz to 389.8 MHz: mobile transmit, base receive;
 - 390.2 MHz to 399.8 MHz base transmit, mobile receive.

ii) T-GSM 410 band:

- for T-GSM 410, the system is required to operate in the following band:
 - 410.2 MHz to 419.8 MHz: mobile transmit, base receive;
 - 420.2 MHz to 429.8 MHz base transmit, mobile receive.

iii) GSM 450 Band:

- for GSM 450, the system is required to operate in the following band:
 - 450.4 MHz to 457.6 MHz: mobile transmit, base receive;
 - 460.4 MHz to 467.6 MHz base transmit, mobile receive.

iv) GSM 480 Band;

- for GSM 480, the system is required to operate in the following band:
 - 478.8 MHz to 486 MHz: mobile transmit, base receive;

- 488.8 MHz to 496 MHz base transmit, mobile receive.

v) GSM 710 Band:

- for GSM 710, the system is required to operate in the following band:
 - 698 MHz to 716 MHz: mobile transmit, base receive;
 - 728 MHz to 746 MHz: base transmit, mobile receive.

vi) GSM 750 Band:

- for GSM 750, the system is required to operate in the following band:
 - 747 MHz to 763 MHz: base transmit, mobile receive;
 - 777 MHz to 793 MHz: mobile transmit, base receive.

vii) T-GSM 810 Band:

- for T-GSM 810, the system is required to operate in the following band:
 - 806 MHz to 821 MHz: mobile transmit, base receive;
 - 851 MHz to 866 MHz: base transmit, mobile receive.

viii) GSM 850 Band:

- for GSM 850, the system is required to operate in the following band:
 - 824 MHz to 849 MHz: mobile transmit, base receive;
 - 869 MHz to 894 MHz: base transmit, mobile receive.

ix) Standard or primary GSM 900 Band, P-GSM:

- for Standard GSM 900 band, the system is required to operate in the following frequency band:
 - 890 MHz to 915 MHz: mobile transmit, base receive;
 - 935 MHz to 960 MHz: base transmit, mobile receive.

x) Extended GSM 900 Band, E-GSM (includes Standard GSM 900 band):

- for Extended GSM 900 band, the system is required to operate in the following frequency band:
 - 880 MHz to 915 MHz: mobile transmit, base receive;
 - 925 MHz to 960 MHz: base transmit, mobile receive.

xi) Railways GSM 900 Band, R-GSM (includes Standard and Extended GSM 900 Band):

- for Railways GSM 900 band, the system is required to operate in the following frequency band:
 - 876 MHz to 915 MHz: mobile transmit, base receive;
 - 921 MHz to 960 MHz: base transmit, mobile receive.

xii) Void:**xiii) DCS 1 800 Band:**

- for DCS 1 800, the system is required to operate in the following band:
 - 1 710 MHz to 1 785 MHz: mobile transmit, base receive;
 - 1 805 MHz to 1 880 MHz: base transmit, mobile receive.

xiv) PCS 1 900 Band:

- for PCS 1 900, the system is required to operate in the following band:
 - 1 850 MHz to 1 910 MHz: mobile transmit, base receive;
 - 1 930 MHz to 1 990 MHz base transmit, mobile receive.

NOTE 1 – The term GSM 400 is used for any GSM system, which operates in any 400 MHz band, including T-GSM 380.

NOTE 2 – The term GSM 700 is used for any GSM system, which operates in any 700 MHz band.

NOTE 3 – The term GSM 850 is used for any GSM system which operates in any 850 MHz band but excluding T-GSM 810.

NOTE 4 – The term GSM 900 is used for any GSM system, which operates in any 900 MHz band.

NOTE 5 – The BTS may cover a complete band, or the BTS capabilities may be restricted to a subset only, depending on the operator needs.

For T-GSM 810 the requirements for GSM 900 shall apply, apart for those parameters for which a separate requirement exists.

Operators may implement networks that operates on a combination of the frequency bands above to support multi band mobile terminals.

The carrier spacing is 200 kHz.

The carrier frequency is designated by the absolute radio frequency channel number (ARFCN). If we call $Fl(n)$ the frequency value of the carrier ARFCN n in the lower band, and $Fu(n)$ the corresponding frequency value in the upper band, we have for the dynamically mapped ARFCNs:

T-GSM 380	$Fl(n) = 380.2 + 0.2*(n-x+y)$	$x \leq n \leq x+z$	$Fu(n) = Fl(n) + 10$
T-GSM 410	$Fl(n) = 410.2 + 0.2*(n-x+y)$	$x \leq n \leq x+z$	$Fu(n) = Fl(n) + 10$
T-GSM 810	$Fl(n) = 806.2 + 0.2*(n-x+y)$	$x \leq n \leq x+z$	$Fu(n) = Fl(n) + 45$
GSM 710	$Fl(n) = 698.2 + 0.2*(n-x+y)$	$x \leq n \leq x+z$	$Fu(n) = Fl(n) + 30$
GSM 750	$Fl(n) = 747.2 + 0.2*(n-x+y)$	$x \leq n \leq x+z$	$Fu(n) = Fl(n) + 30$
DCS 1 800	$Fl(n) = 1710.2 + 0.2*(n-x+y)$	$x \leq n \leq x+z$	$Fu(n) = Fl(n) + 95$
PCS 1 900	$Fl(n) = 1850.2 + 0.2*(n-x+y)$	$x \leq n \leq x+z$	$Fu(n) = Fl(n) + 80$

where the applicable band is indicated by the GSM_Band parameter, $x = \text{ARFCN_FIRST}$, $y = \text{BAND_OFFSET}$ and $z = \text{ARFCN_RANGE}$ (See 3GPP TS 44.018). Parameters defining carrier frequencies not belonging to the indicated band shall not be considered erroneous.

Information about dynamic mapping is provided by System Information type 15 or Packet System Information type 8 if PBCCH exists, and optionally by System Information type 14. Dynamic ARFCN mapping shall be valid for the whole PLMN. Dynamic mapping has priority over the fixed designation of carrier frequencies. The support of dynamic ARFCN mapping is optional for all other mobile stations except those supporting GSM 700 and T-GSM.

$Fl(n)$ and $Fu(n)$ for all other ARFCNs:

P-GSM 900	$Fl(n) = 890 + 0.2*n$	$1 \leq n \leq 124$	$Fu(n) = Fl(n) + 45$
E-GSM 900	$Fl(n) = 890 + 0.2*n$ $Fl(n) = 890 + 0.2*(n-1024)$	$0 \leq n \leq 124$ $975 \leq n \leq 1023$	$Fu(n) = Fl(n) + 45$
R-GSM 900	$Fl(n) = 890 + 0.2*n$ $Fl(n) = 890 + 0.2*(n-1024)$	$0 \leq n \leq 124$ $955 \leq n \leq 1023$	$Fu(n) = Fl(n) + 45$
DCS 1 800	$Fl(n) = 1710.2 + 0.2*(n-512)$	$512 \leq n \leq 885$	$Fu(n) = Fl(n) + 95$
PCS 1 900	$Fl(n) = 1850.2 + 0.2*(n-512)$	$512 \leq n \leq 810$	$Fu(n) = Fl(n) + 80$
GSM 450	$Fl(n) = 450.6 + 0.2*(n-259)$	$259 \leq n \leq 293$	$Fu(n) = Fl(n) + 10$
GSM 480	$Fl(n) = 479 + 0.2*(n-306)$	$306 \leq n \leq 340$	$Fu(n) = Fl(n) + 10$
GSM 850	$Fl(n) = 824.2 + 0.2*(n-128)$	$128 \leq n \leq 251$	$Fu(n) = Fl(n) + 45$

Frequencies are in MHz.

A multi-band MS shall interpret ARFCN numbers 512 to 810 as either DCS 1800 or PCS 1900 frequencies according to the parameter BAND_INDICATOR when received in other than the DCS 1800 or PCS 1900 bands. If received in the DCS 1800 or PCS 1900 bands, those ARFCN numbers shall be interpreted as frequencies in the same band. The BAND_INDICATOR is broadcast on BCCH, PBCCH and SACCH. The most recently received value shall be applied by the mobile station. If the parameter is not broadcast, the default value is DCS 1800 frequencies.

2 Spectrum

Output RF spectrum is the relationship between the frequency offset from the carrier and the power, measured in a specified bandwidth and time, produced by the BTS due to the effects of modulation and power ramping.

The specifications contained in the following sections apply in frequency hopping as well as in non-frequency hopping modes.

Due to the bursty nature of the signal, the output RF spectrum results from two effects: the modulation process, and the power ramping up and down (switching transients).

The power emitted should not exceed -71 dBm in frequency band 2 110-2 170 MHz.

3 Spectrum due to the modulation and wideband noise

The output RF modulation spectrum is specified in the following tables. This specification applies for all RF channels supported by the equipment.

The specification applies to the entire of the relevant transmit band and up to 2 MHz either side.

The specification shall be met under the following measurement conditions:

- for BTS up to 1 800 kHz from the carrier:
 - zero frequency scan, filter bandwidth and video bandwidth of 30 kHz up to 1 800 kHz from the carrier and 100 kHz at 1 800 kHz and above from the carrier, with averaging done over 50 % to 90 % of the useful part of the transmitted bursts, excluding the midamble, and then averaged over at least 200 such burst measurements. Above 1 800 kHz from the carrier only measurements centred on 200 kHz multiples are taken with averaging over 50 bursts;

- for BTS at 1 800 kHz and above from the carrier:
 - swept measurement with filter and video bandwidth of 100 kHz, minimum sweep time of 75 ms, averaging over 200 sweeps. All slots active, frequency hopping disabled;
- when tests are done in frequency hopping mode, the averaging shall include only bursts transmitted when the hopping carrier corresponds to the nominal carrier of the measurement. The specifications then apply to the measurement results for any of the hopping frequencies.

The values in the tables below, at the vertically listed power level (dBm) and at the horizontally listed frequency offset from the carrier (kHz), are then the maximum allowed level (dB) relative to a measurement in 30 kHz on the carrier.

NOTE – This approach of specification has been chosen for convenience and speed of testing. It does however require careful interpretation if there is a need to convert figures in the following tables into spectral density values, in that only part of the power of the carrier is used as the relative reference, and in addition different measurement bandwidths are applied at different offsets from the carrier. Appropriate conversion factors for this purpose are given in 3GPP TS 45.050.

For the BTS, the power level is the "actual absolute output power" defined in 3GPP TS 45.005. If the power level falls between two of the values in the table, the requirement shall be determined by linear interpolation.

In case of the multicarrier BTS class, the requirements for spectrum due to modulation and wideband noise are based on the superposition of the single carrier spectrum requirements for all active carriers taking the different frequency offsets from each carrier into account. In addition to the measurements on a single carrier the output spectrum shall be measured for frequency offsets between 400 kHz above the uppermost and below the lowermost carrier, respectively, and 10 MHz outside the transmit band with all carriers operating at full power at minimum frequency spacing as well as with the carriers distributed across the declared maximum Base Station RF bandwidth as described in 3GPP TS 51.021, specified for the BSS configuration under test. The following requirements apply:

- Depending on the active carrier number N , for frequency offsets higher than or equal to 1.8 MHz, the value of the spectrum due to modulation and wideband noise given for the measurement with single carrier may not increase by more than calculated from the expression $10 \cdot \log(N)$ dB, or fulfil the requirement according to the multicarrier BTS class in 3GPP TS 45.005, whichever is less stringent.
- For frequency offsets less than 1.8 MHz, the unwanted emission must not exceed a mask defined by the cumulation of the spectrum due to modulation and wideband noise from each carrier as well as the possibly occurring IM products.
- In addition, a number of allowable exceptions are defined as stated in v) and vi).

NOTE – This approach has been chosen to limit the wideband noise in the multicarrier operation by aligning with the performance of normal BTSs transmitting several carriers. These BTSs use combiner stages to feed the antenna which leads to a degradation of the noise performance at the antenna in the way as specified above. Above 1.8 MHz frequency offset a generic expression as stated above is applied. For a frequency offset below 1.8 MHz there is no corresponding simple generic expression as the spectrum will be dependent on the output power, carrier spacing as well as the number of active carriers.

In case of non-contiguous frequency allocation and a multicarrier BTS supporting non-contiguous frequency allocations, spectrum due to modulation and wideband noise shall be measured for frequency offsets above the uppermost carrier and frequency offsets below the lowermost carrier as specified above depending on the total number of active carriers N . In addition it shall be measured in-between the two frequency groups with the first frequency group located at carrier frequency A and lower frequencies and a second frequency group located at carrier frequency B and higher

frequencies, where the bandwidth (B – A) specifies the bandwidth between the innermost carriers A and B. The following requirements apply for the range between the two frequency groups:

- Depending on the active carrier number *N*, for frequency offsets higher than or equal to 1.8 MHz both above the uppermost carrier A of the lower frequency group and below the lowermost carrier B of the upper frequency group the value of the spectrum due to modulation and wideband noise given for the measurement of the closest carrier of the innermost carriers A and B may not increase by more than calculated from the expression $10 \cdot \log(N)$ dB, or fulfil the requirement according to the multicarrier BTS class in 3GPP TS 45.005, whichever is less stringent.
- For frequency offsets less than 1.8 MHz above the uppermost carrier A of the lower frequency group or below the lowermost carrier B of the upper frequency group, the unwanted emission must not exceed a mask defined by the cumulation of the spectrum due to modulation and wideband noise from each of the *N* carriers and the IM products.
- In addition, a number of allowable exceptions are defined as stated in vi) and vii).

Two types of requirements are specified, depending on symbol-rate and pulse-shaping filter used:

Case 1: Normal symbol rate using linearized GMSK pulse-shaping filter and higher symbol rate using spectrally narrow pulse shaping filter.

Case 2: Higher symbol rate using spectrally wide pulse shaping filter.

For definition of pulse-shaping filters, see 3GPP TS 45.004.

The spectrally narrow pulse shaping filter in Case 1 and the spectrally wide pulse shaping filter in Case 2 are in this specification referred to as narrow and wide pulse shaping filter respectively.

TABLE 53

Spectrum for GSM 400 and GSM 900 and GSM 850 and MXM 850 and GSM 700 normal BTS

	Power level	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800 < 6 000	≥ 6 000
Case 1	≥ 43	+0,5	-30	-33	-60*	-70	-73	-75	-80
	41	+0,5	-30	-33	-60*	-68	-71	-73	-80
	39	+0,5	-30	-33	-60*	-66	-69	-71	-80
	37	+0,5	-30	-33	-60*	-64	-67	-69	-80
	35	+0,5	-30	-33	-60*	-62	-65	-67	-80
	≤ 33	+0,5	-30	-33	-60*	-60	-63	-65	-80

NOTE – * For equipment supporting QPSK, 8-PSK, 16-QAM or 32-QAM, the requirement for these modulations is -56 dB.

NOTE – GSM 700 BTS shall also comply to the requirements in the applicable FCC rules FCC Part 27, Subpart C, Section 27.53. This may introduce more stringent requirements in frequency bands defined for public safety services.

TABLE 54

Spectrum for GSM 900 and GSM 850 and MXM 850 and GSM 700 micro-BTS

	Power level	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800
Case 1	≤ 33	+0,5	-30	-33	-60*	-60	-63	-70

NOTE – * For equipment supporting QPSK, 8-PSK, 16-QAM or 32-QAM, the requirement for these modulations is -56 dB.

NOTE – GSM 700 micro-BTS shall also comply to the requirements in the applicable FCC rules FCC Part 27, Subpart C, Section 27.53. This may introduce more stringent requirements in frequency bands defined for public safety services.

TABLE 55

Spectrum for GSM 900 and GSM 850 and MXM 850 and GSM 700 pico-BTS

	Power level	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800 < 6 000	≥ 6 000
Case 1	≤ 20	+0,5	-30	-33	-60*	-60	-63	-70	-80

NOTE – * For equipment supporting QPSK, 8-PSK, 16-QAM or 32-QAM, the requirement for these modulations is -56 dB.

NOTE – GSM 700 pico-BTS shall also comply to the requirements in the applicable FCC rules FCC Part 27, Subpart C, Section 27.53. This may introduce more stringent requirements in frequency bands defined for public safety services.

TABLE 56

Spectrum for DCS 1 800 normal BTS

	Power level	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800 < 6 000	≥ 6 000
Case 1	≥ 43	+0,5	-30	-33	-60*	-70	-73	-75	-80
	41	+0,5	-30	-33	-60*	-68	-71	-73	-80
	39	+0,5	-30	-33	-60*	-66	-69	-71	-80
	37	+0,5	-30	-33	-60*	-64	-67	-69	-80
	35	+0,5	-30	-33	-60*	-62	-65	-67	-80
	≤ 33	+0,5	-30	-33	-60*	-60	-63	-65	-80

NOTE – * For equipment supporting QPSK, 8-PSK, 16-QAM or 32-QAM, the requirement for these modulations is -56 dB.

TABLE 57

Spectrum for DCS 1 800 micro-BTS

	Power level	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800
Case 1	35	+0,5	-30	-33	-60*	-62	-65	-76
	≤ 33	+0,5	-30	-33	-60*	-60	-63	-76

NOTE – * For equipment supporting QPSK, 8-PSK, 16-QAM or 32-QAM, the requirement for these modulations is -56 dB.

TABLE 58

Spectrum for DCS 1 800 pico-BTS

	Power level	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800 < 6 000	≥ 6 000
Case 1	≤ 23	+0,5	-30	-33	-60*	-60	-63	-76	-80

NOTE – * For equipment supporting QPSK, 8-PSK, 16-QAM or 32-QAM, the requirement for these modulations is -56 dB.

TABLE 59

Spectrum for PCS 1 900 & MXM 1900 normal BTS

	Power level	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800 < 6 000	≥ 6 000
Case 1	≥ 43	+0,5	-30	-33	-60*	-70	-73	-75	-80
	41	+0,5	-30	-33	-60*	-68	-71	-73	-80
	39	+0,5	-30	-33	-60*	-66	-69	-71	-80
	37	+0,5	-30	-33	-60*	-64	-67	-69	-80
	35	+0,5	-30	-33	-60*	-62	-65	-67	-80
	≤ 33	+0,5	-30	-33	-60*	-60	-63	-65	-80

NOTE – * For equipment supporting QPSK, 8-PSK, 16-QAM or 32-QAM, the requirement for these modulations is -56 dB.

TABLE 60

Spectrum for PCS 1 900 & MXM 1900 micro-BTS

	Power level	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800
Case 1	35	+0,5	-30	-33	-60*	-62	-65	-76
	≤ 33	+0,5	-30	-33	-60*	-60	-63	-76

NOTE – * For equipment supporting QPSK, 8-PSK, 16-QAM or 32-QAM, the requirement for these modulations is -56 dB.

TABLE 61

Spectrum for PCS 1 900 and MXM 1900 pico-BTS

	Power level	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800
Case 1	≤ 23	+0,5	-30	-33	-60*	-60	-63	-76

NOTE – * For equipment supporting QPSK, 8-PSK, 16-QAM or 32-QAM, the requirement for these modulations is -56 dB.

The following exceptions shall apply, using the same measurement conditions as specified above.

- i) In the combined range 600 kHz to 6 MHz above and below the carrier, in up to three bands of 200 kHz width centred on a frequency which is an integer multiple of 200 kHz, exceptions at up to –36 dBm are allowed.
- ii) Above 6 MHz offset from the carrier in up to 12 bands of 200 kHz width centred on a frequency which is an integer multiple of 200 kHz, exceptions at up to –36 dBm are allowed. For the BTS only one transmitter is active for this test.

Using the same measurement conditions as specified above, if a requirement in tables is tighter than the limit given in the following, the latter shall be applied instead.

- iii) For normal but not for multicarrier BTS, whereby the levels given here in dB are relative to the output power of the BTS at the lowest static power level measured in 30 kHz see Table 62.

TABLE 62

Frequency offset from the carrier	GSM 400 & GSM 900 & GSM 850 & MXM 850 & GSM 700	DCS 1 800 & PCS 1 900 & MXM 1900
< 1 800 kHz	max {–88 dB, –65 dBm}	max {–88 dB, –57 dBm}
≥ 1 800 kHz	max {–83 dB, –65 dBm}	max {–83 dB, –57 dBm}

- iv) For micro and pico – BTS, at 1 800 kHz and above from the carrier see Table 63.

TABLE 63

Power Class	GSM 900 & GSM 850 & MXM 850 & GSM 700	DCS 1 800 & PCS 1 900 & MXM 1900
M1	–59 dBm	–57 dBm
M2	–64 dBm	–62 dBm
M3	–69 dBm	–67 dBm
P1	–68dBm	–65dBm

Using the same measurement conditions as specified above for multicarrier BTS, the following exceptions are allowed for BTS belonging to the multicarrier BTS class when one or more carriers are active:

- v) At offsets between 600 kHz above the uppermost and below the lowermost carrier, respectively, and 10 MHz outside the transmit band, in bands of 200 kHz width centred on a frequency, which is an integer multiple of 200 kHz, exceptions are allowed for N active carriers at $M = 18 + 3 * (N - 1)$ or up to maximum 40 bands, whichever the lowest. All exceptions are measured in 100 kHz bandwidth, averaged over the 200 kHz band and may be up to –36 dBm. In addition, all exceptions within the relevant transmit band and up to four exceptions at offsets up to 2 MHz from the respective band edges, may be up to –70 dBc relative to the carrier measured in a bandwidth of 100 kHz, or –36 dBm, whichever less stringent.
- vi) At offsets larger than 600 kHz from the carrier, if a requirement in tables 54, 57, and 60 adjusted according to the multicarrier BTS requirements, is more stringent than –47 dBm, the latter requirement shall be applied instead.

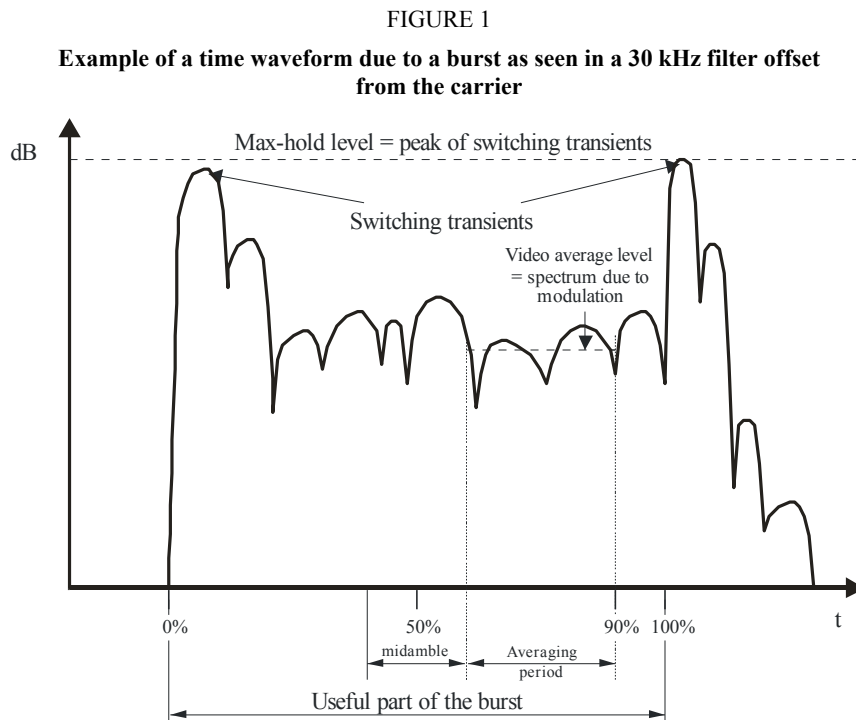
- vii) The following applies in case of a non-contiguous frequency allocation. The same total number of exceptions M for N active carriers apply as given in v) including the range of frequency offsets between 0.6 MHz above the uppermost carrier of the lower frequency group and 0.6 MHz below the lowermost carrier of the upper frequency group.

4 Spectrum due to switching transients

Those effects are also measured in the time domain and the specifications assume the following measurement conditions: zero frequency scan, filter bandwidth 30 kHz, peak hold, and video bandwidth 100 kHz.

In case of the multicarrier BTS class, the measurement of the switching transients outside the BTS transmit band is covered by a measurement procedure stated in § 5 (spurious emissions). For measurements of switching transients inside the transmit band, the measurement is performed with a single active carrier at maximum declared power.

The example of a waveform due to a burst as seen in a 30 kHz filter offset from the carrier is given thereunder (Fig. 1).



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The maximum level measured, after any filters and combiners, at the indicated offset from the carrier, shall be the values in Table 65 or -36 dBm, whichever is higher.

TABLE 64

Maximum switching transients for base station

	Maximum level measured			
	400 kHz	600 kHz	1 200 kHz	1 800 kHz
GSM 400 & GSM 900 & GSM 850 & MXM 850 & GSM 700 (GMSK)	-57 dBc	-67 dBc	-74 dBc	-74 dBc
GSM 400 & GSM 900 & GSM 850 & MXM 850 & GSM 700 (QPSK, 8-PSK, 16-QAM, 32-QAM)	-52 dBc	-62 dBc	-74 dBc	-74 dBc
DCS 1 800 & PCS 1 900 & MXM 1900 (GMSK)	-50 dBc	-58 dBc	-66 dBc	-66 dBc
DCS 1 800 & PCS 1 900 & MXM 1900 (QPSK, 8-PSK, 16-QAM, 32-QAM)	-50 dBc	-58 dBc	-66 dBc	-66 dBc

dBc means relative to the output power at the BTS, measured at the same point and in a filter bandwidth of at least 300 kHz.

5 Transmitter spurious emissions

The limits specified thereunder are based on a 5-pole synchronously tuned measurement filter.

In addition to the requirements of this section, the PCS 1 900 & MXM 1900 BTS shall also comply with the applicable limits for spurious emissions established by the FCC rules for wideband PCS services FCC Title 47 CFR Part 24.

In addition to the requirements of this section, the GSM 850 & MXM 850 BTS shall also comply with the applicable limits for spurious emissions established by the FCC rules for public mobile services FCC Part 22, Subpart H.

In addition to the requirements of this section, the GSM 700 BTS shall also comply with the applicable limits for spurious emissions established by the FCC FCC Part 27, Subpart C, Section 27.53.

NOTE – This may introduce more stringent requirements than specified in this section for frequency bands dedicated for public safety services.

5.1 Principle of the specification

In this section, the spurious transmissions (whether modulated or unmodulated) and the switching transients are specified together by measuring the peak power in a given bandwidth at various frequencies. The bandwidth is increased as the frequency offset between the measurement frequency and, either the carrier, or the edge of the BTS transmit band, increases. The effect for spurious signals of widening the measurement bandwidth is to reduce the allowed total spurious energy per MHz. The effect for switching transients is to effectively reduce the allowed level of the switching transients (the peak level of a switching transient increases by 6 dB for each doubling of

the measurement bandwidth). The conditions are specified in the following table, a peak-hold measurement being assumed.

In case of the multicarrier BTS class, instead of a peak-hold measurement an average measurement is assumed.

Furthermore, the measurement configuration as defined in § 3 for the multicarrier BTS class shall be applied.

The measurement conditions for radiated and conducted spurious are specified separately in 3GPP TS 51.010 and 3GPP TS 51.02x series. The frequency bands where these are actually measured may differ from one type to the other (see 3GPP TS 51.010 and 3GPP TS 51.02x series).

TABLE 65

In band spurious measurement conditions

Band	Frequency offset	Measurement bandwidth
Relevant transmit band	(offset from carrier)	
	≥ 1,8 MHz	30 kHz
	≥ 6 MHz	100 kHz

TABLE 66

Out of band spurious measurement conditions

Band	Frequency offset	Measurement bandwidth
100 kHz to 50 MHz	–	10 kHz
50 MHz to 500 MHz and outside the relevant transmit band	(offset from edge of the relevant transmit band)	
	≥ 2 MHz	30 kHz
	≥ 5 MHz	100 kHz
500 MHz to 1 000 MHz and outside the relevant transmit band	(offset from edge of the relevant transmit band)	
	≥ 2 MHz	30 kHz
	≥ 5 MHz	100 kHz
	≥ 10 MHz	300 kHz
	≥ 20 MHz	1 MHz
	≥ 30 MHz	3 MHz
Above 1 000 MHz and outside the relevant transmit band	(offset from edge of the relevant transmit band)	
	≥ 2 MHz	30 kHz
	≥ 5 MHz	100 kHz
	≥ 10 MHz	300 kHz / 1 MHz ^(Note)
	≥ 20 MHz	1 MHz
	≥ 30 MHz	3 MHz

NOTE – 1 MHz measurement bandwidth applies only to BTS belonging to the multicarrier BTS class.

The measurement settings assumed correspond, for the resolution bandwidth to the value of the measurement bandwidth in the table, and for the video bandwidth to approximately three times this value.

5.1.1 Relation to definitions and requirements in CEPT/ERC/REC 74-01 and ITU-R SM.329

In this section for all equipment the term spurious emission out-of-band is used for all spurious transmissions outside the relevant transmit band (whether modulated or unmodulated), comprised of contributions from noise, intermodulation and non-harmonic emissions. For multicarrier BTS the definition of the requirements are aligned with the definitions in ITU-R SM.329 and REC 74-01 in that:

- Unwanted emissions in multicarrier operation are specified in § 3 (including the reference to intermodulation in 3GPP TS 45.005) in present specification, both for inband and out-of band emissions up to $2 \cdot BW$ frequency offset from edge of relevant transmit band, where BW is the transmitter bandwidth used as the necessary bandwidth for determining the boundary between the out-of-band and spurious domains. The transmitter bandwidth is defined as the width of the frequency band covering the envelope of the transmitted carriers.
- Minimum required transmitter bandwidth for each operator is assumed to be 5 MHz, i.e. BW is 5 MHz.
- Spurious emissions according to REC 74-01 definition are specified in 3GPP TS 45.005 from $2 \cdot BW = 10$ MHz and higher frequency offsets. The 10 MHz spurious domain boundary applies also for larger transmitter bandwidths.
- In addition there is an upper limit for the unwanted emissions from 0 to 10 MHz frequency offset outside the relevant transmit band edge according to 3GPP TS 45.005.

The relevant transmit bands are defined in § 1.

6 Coexistence with services in adjacent frequency bands

This requirement provides for the protection of receivers operating in bands adjacent to the MS transmit frequency band of 1 920 MHz to 1 980 MHz: GSM 900, R-GSM, UTRA TDD.

For coexistence in the same geographic area, the powers measured in the conditions specified in § 3, with a filter and video bandwidth of 100 kHz, shall be no more than specified in Table 67.

TABLE 67

Coexistence power limits

For coexistence with BTS:	Frequency band	Power measured (dBm)	Required for BTS (Note 3)
GSM 900	921-960 MHz	≤ -57	T-GSM 810, GSM 400 & DCS 1800
DCS 1800	1 805-1 880 MHz	≤ -47	T-GSM 810, GSM 400 & GSM 900
GSM 400	460.4-467.6 MHz and 488.8-496.0 MHz	≤ -57	T-GSM 810, GSM 900 & DCS 1800 (Note 1)
PCS 1900 & MXM 1900	1 930-1 990 MHz	≤ -47	GSM 700, GSM 850, MXM 850

TABLE 67 (end)

For coexistence with BTS:	Frequency band	Power measured (dBm)	Required for BTS (Note 3)
GSM 850 & MXM 850	869-894 MHz	≤ -57	GSM 700, PCS 1900 & MXM 1900 (Note 2)
GSM 700	728-746 MHz and 747-763 MHz	≤ -57	GSM 850, MXM 850, PCS 1900 & MXM 1900 (Note 2)
T-GSM 810	851-866 MHz	≤ -57	GSM 400, GSM 900 & DCS 1800

NOTE 1 – These requirements should also be applied to GSM 900 and DCS 1800 BTS built to a HW specification for R98 or earlier.

NOTE 2 – These requirements should also be applied to GSM 850 & MXM 850 BTS and PCS 1900 & MXM 1900 BTS built to a HW specification for R99 or earlier.

NOTE 3 – These requirements should also be applied to any additional combination of BTSs in different frequency bands operating in the same geographic area.

Measures must be taken for mutual protection of receivers when BTS of different bands are co-sited.

NOTE 4 – Thus, for this case, the power measured from the BTS transmitter in the conditions specified in § 3, with a filter and video bandwidth of 100 kHz should be no more than the values in 3GPP TS 45.005, assuming the coupling losses stated in the same subclause, to protect co-sited BTS receivers for:

GSM 400 in the bands 450.4-457.6 MHz and 478.8-486.0 MHz

T-GSM 810 in the band 806-821 MHz

GSM 900 in the band 876-915 MHz

DCS 1 800 in the band 1 710-1 785 MHz

PCS 1 900 or MXM 1 900 in the band 1 850-1 910 MHz

GSM 850 or MXM 850 in the band 824-849 MHz

GSM 700 in the bands 698-716 MHz and 777-793 MHz

6.2 Additional requirements for coexistence with other 3G technologies

In geographic areas where GERAN and UTRA networks are deployed, the power measured in the conditions specified in § 3, with a filter and video bandwidth of 100 kHz shall be no more than shown in Table 68.

TABLE 68

Coexistence power limits

Band (MHz)	Power (dBm)	Note
1 880-1 920 ^(Note)	-62	E-UTRA/TDD band
1 900-1 920	-62	UTRA/TDD band
1 920-1 980	-62	UTRA/FDD BS Rx band
2 010-2 025	-62	UTRA/TDD band
2 110-2 170	-62	UTRA/FDD UE Rx band
2 300-2 400	-62	E-UTRA/TDD band
2 500-2 570	-62	E-UTRA/FDD BS Rx band
2 570-2 620	-62	E-UTRA/TDD band
2 620-2 690	-62	E-UTRA/FDD UE Rx band

NOTE – Only if regionally required.

When GERAN and UTRA BS are co-located, the power measured in the conditions specified in § 3, with a filter and video bandwidth of 100 kHz shall be no more than given in Table 69.

TABLE 69
Co-located coexistence power limits

Band (MHz)	Power (dBm)	Note
1 880-1 920 ^(Note)	-96	E-UTRA/TDD band
1 900-1 920	-96	UTRA/TDD band
1 920-1 980	-96	UTRA/FDD BS Rx band
2 010-2 025	-96	UTRA/TDD band
2 110-2 170	-62	UTRA/FDD UE Rx band
2 300-2 400	-96	E-UTRA/TDD band
2 500-2 570	-96	E-UTRA/FDD BS Rx band
2 570-2 620	-96	E-UTRA/TDD band
2 620-2 690	-62	E-UTRA/FDD UE Rx band

NOTE – Only if regionally required.

NOTE 1 – The requirements in this section should also be applied to BTS built to a hardware specification for R98 or earlier. For a BTS built to a hardware specification for R98 or earlier, with an 8-PSK capable transceiver installed, the 8-PSK transceiver shall meet the R99 requirement.

7 Receiver spurious emissions (idle mode)

The limits specified thereunder are based on a 5-pole synchronously tuned measurement filter.

In addition to the requirements of this section, the PCS 1 900 & MXM 1900 BTS shall also comply with the applicable limits for spurious emissions established by the FCC rules for wideband PCS services FCC Title 47 CFR Part 24.

In addition to the requirements of this section, the GSM 850 & MXM 850 BTS shall also comply with the applicable limits for spurious emissions established by the FCC rules for public mobile services FCC Part 22, Subpart H.

In addition to the requirements of this section, the GSM 700 BTS shall also comply with the applicable limits for spurious emissions established by the FCC FCC Part 27, Subpart C, Section 27.53.

NOTE – This may introduce more stringent requirements than specified in this section for frequency bands dedicated for public safety services.

7.1 Principle of the specification

In this section, the spurious transmissions (whether modulated or unmodulated) and the switching transients are specified together by measuring the peak power in a given bandwidth at various frequencies. The bandwidth is increased as the frequency offset between the measurement frequency and, either the carrier, or the edge of the BTS transmit band, increases. The effect for spurious signals of widening the measurement bandwidth is to reduce the allowed total spurious energy per MHz. The effect for switching transients is to effectively reduce the allowed level of the switching transients (the peak level of a switching transient increases by 6 dB for each doubling of the measurement bandwidth). The conditions are specified in the following table, a peak-hold measurement being assumed.

In case of the multicarrier BTS class, instead of a peak-hold measurement an average measurement is assumed.

Furthermore, the measurement configuration as defined in § 3 for the multicarrier BTS class shall be applied.

The measurement conditions for radiated and conducted spurious are specified separately in 3GPP TS 51.010 and 3GPP TS 51.02x series. The frequency bands where these are actually measured may differ from one type to the other (see 3GPP TS 51.010 and 3GPP TS 51.02x series).

TABLE 70

In band spurious measurement conditions

Band	Frequency offset	Measurement bandwidth
Relevant transmit band	(offset from carrier)	
	$\geq 1,8$ MHz	30 kHz
	≥ 6 MHz	100 kHz

TABLE 71

Out of band spurious measurement conditions

Band	Frequency offset	Measurement bandwidth
100 kHz to 50 MHz	–	10 kHz
50 MHz to 500 MHz and outside the relevant transmit band	(offset from edge of the relevant transmit band)	
	≥ 2 MHz	30 kHz
	≥ 5 MHz	100 kHz
500 MHz to 1 000 MHz and outside the relevant transmit band	(offset from edge of the relevant transmit band)	
	≥ 2 MHz	30 kHz
	≥ 5 MHz	100 kHz
	≥ 10 MHz	300 kHz
	≥ 20 MHz	1 MHz
	≥ 30 MHz	3 MHz
Above 1 000 MHz and outside the relevant transmit band	(offset from edge of the relevant transmit band)	
	≥ 2 MHz	30 kHz
	≥ 5 MHz	100 kHz
	≥ 10 MHz	300 kHz / 1 MHz ^(Note)
	≥ 20 MHz	1 MHz
	≥ 30 MHz	3 MHz

NOTE – 1 MHz measurement bandwidth applies only to BTS belonging to the multicarrier BTS class.

The measurement settings assumed correspond, for the resolution bandwidth to the value of the measurement bandwidth in the table, and for the video bandwidth to approximately three times this value.

7.1.1 Relation to definitions and requirements in CEPT/ERC/REC 74-01 and ITU-R SM.329

In this section for all equipment the term spurious emission out-of-band is used for all spurious transmissions outside the relevant transmit band (whether modulated or unmodulated), comprised of contributions from noise, intermodulation and non-harmonic emissions. For multicarrier BTS the definition of the requirements are aligned with the definitions in ITU-R SM.329 and REC 74-01 in that:

- Unwanted emissions in multicarrier operation are specified in § 3 (including the reference to intermodulation in 3GPP TS 45.005) in present specification, both for inband and out-of band emissions up to $2 \cdot BW$ frequency offset from edge of relevant transmit band, where BW is the transmitter bandwidth used as the necessary bandwidth for determining the boundary between the out-of-band and spurious domains. The transmitter bandwidth is defined as the width of the frequency band covering the envelope of the transmitted carriers.
- Minimum required transmitter bandwidth for each operator is assumed to be 5 MHz, i.e. BW is 5 MHz.
- Spurious emissions according to REC 74-01 definition are specified in 3GPP TS 45.005 from $2 \cdot BW = 10$ MHz and higher frequency offsets. The 10 MHz spurious domain boundary applies also for larger transmitter bandwidths.
- In addition there is an upper limit for the unwanted emissions from 0 to 10 MHz frequency offset outside the relevant transmit band edge according to 3GPP TS 45.005.
- The relevant transmit bands are defined in § 1.

Annex 5

FDMA/TDMA (Digital enhanced cordless telecommunications (DECT)) base stations

1 Spectrum mask

If the equipment under test (EUT) is equipped with antenna diversity, the EUT should have the diversity operation defeated for the following tests.

2 Emissions due to modulation

The unwanted emission(s) due to modulation is the power measured in any DECT RF channel other than the one in which the EUT is transmitting, integrated over a bandwidth of 1 MHz.

With transmissions on physical channel R_a (K, L, M, N) in successive frames, the power in physical channel R_a (K, L, Y, N) should be less than the values given in Table 72.

TABLE 72

Emissions modulation

Emissions on RF channel “Y”	Measurement bandwidth	Maximum power level
$Y = M \pm 1$	(1)	160 μ W (–8 dBm)
$Y = M \pm 2$	(1)	1 μ W (–30 dBm)
$Y = M \pm 3$	(1)	80 nW (–41 dBm)
Y = any other DECT channel	(1)	40 nW (–44 dBm) ⁽²⁾

(1) The power in RF channel Y is defined by integration over a bandwidth of 1 MHz centred on the nominal centre frequency, F_Y , averaged over at least 60% but less than 80% of the physical packet, and starting before 25% of the physical packet has been transmitted but after the synchronization word.

(2) For Y = “any other DECT channel”, the maximum power level should be less than 40 nW (–44 dBm) except for one instance of a 500 nW (–33 dBm) signal.

3 Emissions due to transmitter transients

The power level of all modulation products (including AM components due to the switching on or off of the modulated RF carrier) in a DECT RF channel as a result of a transmission on another DECT RF channel.

The power level of all modulation products (including AM products due to the switching on or off of a modulated RF carrier) arising from a transmission on RF channel M should, when measured using a peak hold technique, be less than the values given in Table 73.

TABLE 73

Emissions due to transmitter transients

Emissions on RF channel “Y”	Measurement bandwidth	Maximum power level
$Y = M \pm 1$	(1)	250 μ W (–6 dBm)
$Y = M \pm 2$	(1)	40 μ W (–14 dBm)
$Y = M \pm 3$	(1)	4 μ W (–24 dBm)
Y = any other DECT channel	(1)	1 μ W (–30 dBm)

(1) The measurement bandwidth should be 100 kHz and the power should be integrated over a 1 MHz bandwidth centred on the DECT frequency, F_Y .

4 Transmitter spurious emissions (conducted)**4.1 Spurious emissions when allocated a transmit channel**

The spurious emissions, when a radio end point has an allocated physical channel, should meet the requirements of Table 74. The requirements of Table 62 are only applicable for frequencies which are greater than 12.5 MHz away from the centre frequency, f_c , of a carrier.

TABLE 74

Spurious emissions requirements

Frequency	Minimum requirement/ Reference bandwidth
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	-36 dBm/100 kHz
$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	-30 dBm/1 MHz
$f_c - 12.5 \text{ MHz} < f < f_c + 12.5 \text{ MHz}$	Not defined

Measurements should not be made for transmissions on the RF channel closest to the nearest band edge for frequency offsets of up to 2 MHz.

5 Receiver spurious emissions (idle mode)**5.1 Spurious emissions when the EUT has no allocated transmit channel**

The power level of any spurious emissions when the radio end point has no allocated transmit channel should not exceed the limits specified in Table 75.

TABLE 75

Receiver spurious emissions

Frequency band	Measurement bandwidth	Maximum level (dBm)	Note
$30 \text{ MHz} \leq f < 1 \text{ GHz}$	100 kHz ⁽¹⁾	-57	With the exception of the frequencies within the DECT band, covered by Table 50
$1 \text{ GHz} \leq f \leq 12.75 \text{ GHz}$	1 MHz ⁽¹⁾	-47	

⁽¹⁾ The power should be measured using a peak hold technique.

5.2 In the DECT band

The power level of any receiver spurious emissions within the DECT band should not exceed the limit in Table 76.

TABLE 76

Receiver spurious emissions within DECT band

Frequency band (MHz)	Measurement bandwidth (MHz)	Maximum level (dBm)
1 900-1 920 2 010-2 025	1	-57 ⁽¹⁾

⁽¹⁾ The following exceptions are allowed:

- in one 1 MHz band, the maximum allowable e.r.p. should be less than 20 nW;
- in up to two bands of 30 kHz, the maximum e.r.p. should be less than 250 nW.

Annex 6

IMT-2000 OFDMA TDD WMAN base stations

1 Introduction

This Annex identifies unwanted emission limits for IMT-2000 OFDMA TDD WMAN base stations.

OFDMA TDD WMAN base stations comply with all local and/or regional rules and regulations applicable to them. All such regulations take precedence over the limits expressed in this Annex.

2 Spectrum emission mask

2.1 Default spectrum emission mask

The spectrum masks of Tables 77 and 78 are applicable to all bands and all regions unless specific mask for a band or a region is specified in a relevant subsection of § 2.

TABLE 77

Spectrum emission mask for 5 MHz carrier

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 7.5	100	$-7-7(\Delta f-2.55)/5$
7.5 to ≤ 12.5	100	-14

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 100 kHz filter is at Δf equals to 2.550 MHz; the last is at Δf equals to 12.450 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

TABLE 78

Spectrum emission mask for 10 MHz carrier

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5 to < 10	100	$-7-7(\Delta f-5.05)/5$
10 to < 15	100	-14
15 to ≤ 25	1 000	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 100 kHz filter is at Δf equals to 5.05 MHz; the last is at Δf equals to 14.95 MHz. The first measurement position with a 1 MHz filter is at Δf equals to 15.5 MHz; the last is at Δf equals to 24.5 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

2.2 Spectrum emission mask for TDD equipment operating in the band 2 300-2 400 MHz (BCG 1.A/1.B)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the base station centre frequency for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

TABLE 79

Spectrum emission mask for 5 MHz carrier

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$2.5 \leq \Delta f < 3.5$ MHz	-13 dBm	50 kHz
$3.5 \leq \Delta f < 12.5$ MHz	-13 dBm	1 MHz

TABLE 80

Spectrum emission mask for 10 MHz carrier

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$5 \leq \Delta f < 6$ MHz	-13 dBm	100 kHz
$6 \leq \Delta f < 25$ MHz	-13 dBm	1 MHz

TABLE 81

Spectrum emission mask for 8.75 MHz carrier

(a) $P_{tx} \geq 40$ dBm

Frequency offset from centre	Allowed emission	Measurement bandwidth
$4.77 \leq \Delta f < 22.5$ MHz	-56.9 dBc	100 kHz
$\Delta f > 22.5$ MHz	-13 dBm	1 MHz

(b) $29 \text{ dBm} \leq P_{tx} < 40 \text{ dBm}$

Frequency offset from centre	Allowed emission	Measurement bandwidth
$4.77 \leq \Delta f < 22.5$ MHz	-53.9 dBc	100 kHz
$\Delta f > 22.5$ MHz	-13 dBm	1 MHz

(c) $P_{tx} < 29 \text{ dBm}$

Frequency offset from centre	Allowed emission	Measurement bandwidth
$4.77 \leq \Delta f < 22.5$ MHz	-14.5 dBm	1 MHz
$\Delta f > 22.5$ MHz	-13 dBm	1 MHz

NOTE 1 – Definition of dBc from Recommendation ITU-R SM.329-10: Decibels relative to the unmodulated carrier power of the emission. In the cases which do not have a carrier, for example in some digital modulation schemes where the carrier is not accessible for measurement, the reference level equivalent to dBc is decibels relative to the mean power P .

2.3 Spectrum emission mask for TDD equipment operating in the band 2 500-2 690 MHz (BCG 3.A)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the base station centre frequency for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

TABLE 82

Spectrum emission mask for 5 MHz carrier

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$2.5 \leq \Delta f < 3.5$ MHz	-13 dBm	50 kHz
$3.5 \leq \Delta f < 12.5$ MHz	-13 dBm	1 MHz

TABLE 83

Spectrum emission mask for 10 MHz carrier

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$5 \leq \Delta f < 6$ MHz	-13 dBm	100 kHz
$6 \leq \Delta f < 25$ MHz	-13 dBm	1 MHz

TABLE 84

Adjacent channel leakage power – Japan

Channel size	Measurement frequency range (MHz)	Allowed adjacent channel leakage power (dBm)
5 MHz	$2.6 < \Delta f < 7.4$	7
10 MHz	$5.25 < \Delta f < 14.75$	3

TABLE 85

Spectrum emission mask for 5 MHz carrier – Japan

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$7.5 \text{ MHz} \leq \Delta f < 12.25$	$-15 - 1.4 \times (\Delta f - 7.5)$ dBm	1 MHz
$12.25 \leq \Delta f < 22.5$ MHz	-22 dBm	1 MHz

NOTE 1 – The adjacent channel leakage power for the 5 MHz channel from 2.6 MHz to 7.4 MHz is shown in Table 84.

TABLE 86

Spectrum emission mask for 10 MHz carrier – Japan

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$15 \leq \Delta f < 25$ MHz	-22 dBm	1 MHz

NOTE 1 – The adjacent channel leakage power for the 10 MHz channel from 5.25 MHz to 14.75 MHz is shown in Table 84.

2.4 Spectrum emission mask for FDD equipment operating in the band 2 496-2 572/2 614-2 690 MHz (BCG 3.B)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the base station centre frequency for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

TABLE 87

Spectrum emission mask for 5 MHz carrier

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 3.5	50	-13
3.5 to ≤ 12.5	1 000	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 50 kHz filter is at Δf equals to 2.525 MHz; the last is at Δf equals to 3.475 MHz. The first measurement position with a 1 MHz filter is at Δf equals to 4.0 MHz; the last is at Δf equals to 12.0 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

TABLE 88

Spectrum emission mask for 10 MHz carrier

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5 to < 6	100	-13
6 to ≤ 25	1 000	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 100 kHz filter is at Δf equals to 5.050 MHz; the last is at Δf equals to 5.950 MHz. The first measurement position with a 1 MHz filter is at Δf equals to 6.5 MHz; the last is at Δf equals to 24.5 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

TABLE 89

Spectrum emission mask for 5 MHz carrier – Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 7.5	100	$-7-7(\Delta f-2.55)/5$
7.5 to ≤ 12.5	100	-14

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 100 kHz filter is at Δf equals to 2.550 MHz; the last is at Δf equals to 12.450 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

TABLE 90

Spectrum emission mask for 10 MHz carrier – Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5 to < 10	100	$-7-7(\Delta f-5.05)/5$
10 to < 15	100	-14
15 to ≤ 25	1 000	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

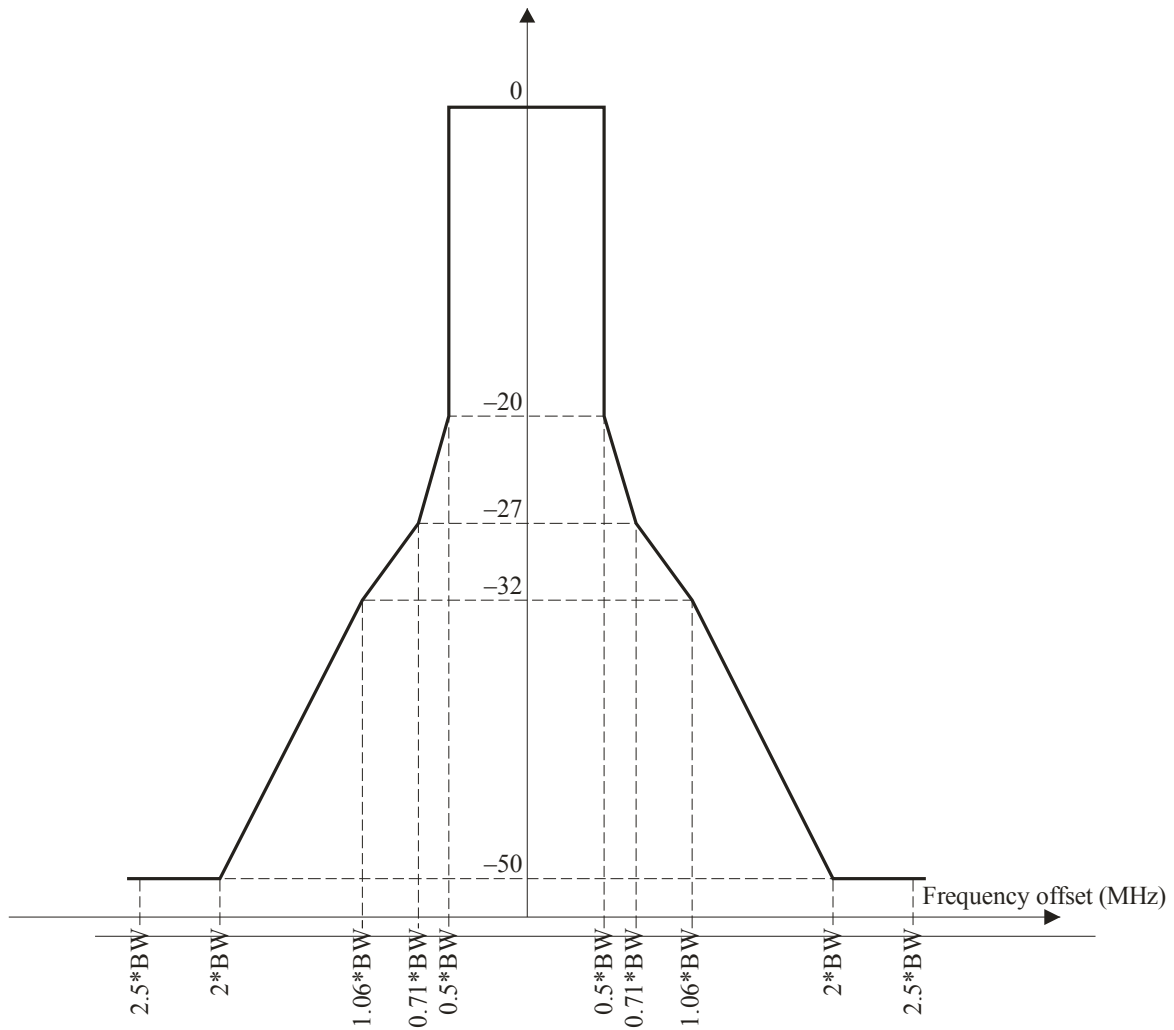
NOTE 2 – The first measurement position with a 100 kHz filter is at Δf equals to 5.05 MHz; the last is at Δf equals to 14.95 MHz. The first measurement position with a 1 MHz filter is at Δf equals to 15.5 MHz; the last is at Δf equals to 24.5 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

2.5 Spectrum emission mask for TDD equipment operating in the band 3 400-3 600 MHz (BCG 5L.A/5L.B/5L.C)

The spectrum emission mask for 5, 7 and 10 MHz bandwidth sizes are specified in Table 87. This mask is a relative mask with breakpoints of the underlying piecewise linear power density mask. This mask is conditionally applicable depending on the base station P_{nom} power level.

FIGURE 2
Relative power spectral density (dB)



M.1580-02

TABLE 91

Relative transmit spectral power density mask

Power	Frequency offset				
	0.5*BW	0.71*BW	1.06*BW	2.0*BW	2.5*BW
$39 \text{ dBm} < P_{nom}$	-20 dB	-27 dB	-32 dB	-50dB	-50 dB
$33 \text{ dBm} < P_{nom} \leq 39 \text{ dBm}$	-20 dB	-27 dB	-32 dB	-50 dB + (39 dBm - P_{nom})	Refer to Table 92

TABLE 92

Absolute spectral emission mask

Power	Frequency offset			
	$0.50 \text{ BW} \leq \Delta f < 0.71 \text{ BW}$	$0.71 \text{ BW} \leq \Delta f < 1.06 \text{ BW}$	$1.06 \text{ BW} \leq \Delta f < 2.00 \text{ BW}$	$2.00 \text{ BW} \leq \Delta f \leq 2.50 \text{ BW}$
$33 \text{ dBm} < P_{nom} \leq 39 \text{ dBm}$	Refer to Table 91	Refer to Table 91	Refer to Table 91	$-21 + x \text{ dBm/MHz}$
$P_{nom} \leq 33 \text{ dBm}$	-5.5 dBm/MHz	-5.5 dBm/MHz	-23.5 dBm/MHz	-23.5 dBm/MHz

NOTE 1 – $x = -10 \log(\text{BW}/10)$.

NOTE 2 – BW: Channel bandwidth in MHz.

NOTE 3 – P_{nom} : Transmitter nominal maximum output power.

2.6 Spectrum emission mask for TDD equipment operating in the band 3 600-3 800 MHz (BCG 5H.A/5H.B/5H.C)

The spectrum emission mask for 5, 7 and 10 MHz bandwidth sizes are specified in Table 91. Table 92 specifies breakpoints of the underlying piecewise linear power spectral density mask. This mask is a relative mask and conditionally applicable depending on the base station P_{nom} power level.

TABLE 93

Relative spectrum emission mask

Power	Frequency offset				
	$0.5 \cdot \text{BW}$	$0.71 \cdot \text{BW}$	$1.06 \cdot \text{BW}$	$2.0 \cdot \text{BW}$	$2.5 \cdot \text{BW}$
$39 \text{ dBm} < P_{nom}$	-20 dB	-27 dB	-32 dB	-50 dB	-50 dB
$33 \text{ dBm} < P_{nom} \leq 39 \text{ dBm}$	-20 dB	-27 dB	-32 dB	$-50 \text{ dB} + (39 \text{ dBm} - P_{nom})$	Refer to Table 94

TABLE 94

Absolute spectral emission

Power	Frequency offset			
	$0.50 \text{ BW} \leq \Delta f < 0.71 \text{ BW}$	$0.71 \text{ BW} \leq \Delta f < 1.06 \text{ BW}$	$1.06 \text{ BW} \leq \Delta f < 2.00 \text{ BW}$	$2.00 \text{ BW} \leq \Delta f \leq 2.50 \text{ BW}$
$33 \text{ dBm} < P_{nom} \leq 39 \text{ dBm}$	Refer to Table 81	Refer to Table 81	Refer to Table 81	$-21 + x \text{ dBm/MHz}$
$P_{nom} \leq 33 \text{ dBm}$	-5.5 dBm/MHz	-5.5 dBm/MHz	-23.5 dBm/MHz	-23.5 dBm/MHz

NOTE 1 – $x = -10 \log(\text{BW}/10)$

NOTE 2 – BW: Channel bandwidth in MHz

NOTE 3 – P_{nom} : Transmitter nominal maximum output power

2.7 Spectrum emission mask for FDD equipment operating in the band 1 710-1 770/2 110-2 170 MHz (BCG 6.A)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the base station centre frequency for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

Tables 95 and 96 specify the spectrum emissions for FDD base stations with 5 and 10 MHz channel bandwidths.

TABLE 95

Spectrum emission mask for 5 MHz carrier

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$2.5 \leq \Delta f < 3.5$ MHz	-13 dBm	50 kHz
$3.5 \leq \Delta f < 12.5$ MHz	-13 dBm	1 MHz

TABLE 96

Spectrum emission mask for 10 MHz carrier

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$5 \leq \Delta f < 6$ MHz	-13 dBm	100 kHz
$6 \leq \Delta f < 25$ MHz	-13 dBm	1 MHz

NOTE 1 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

NOTE 2 – Protection requirement beyond 25 MHz (250% of the bandwidth) is specified in the spurious emissions requirement.

2.8 Spectrum emission mask for FDD equipment operating in the band 1 920-1 980/2 110-2 170 MHz (BCG 6.B)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the base station centre frequency for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

Tables 97 and 98 specify the spectrum emissions for FDD base stations with 5 and 10 MHz channel bandwidths.

TABLE 97

Spectrum emission mask for 5 MHz carrier

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$2.5 \leq \Delta f < 7.5$ MHz	$-7.0-7/5 \times (\Delta f-2.55)$ dBm	100 kHz
$7.5 \leq \Delta f < 12.5$ MHz	-14 dBm	100 kHz

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 100 kHz filter is at Δf equals to 2.55 MHz; the last is at Δf equals to 12.45 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

TABLE 98

Spectrum emission mask for 10 MHz carrier

Frequency offset from centre	Allowed emission level	Measurement bandwidth
$5 \leq \Delta f < 6$ MHz	$-7.0-7/5 \times (\Delta f-5.05)$ dBm	100 kHz
$10 \leq \Delta f < 15$ MHz	-14 dBm	100 kHz
$15 \leq \Delta f < 25$ MHz	-13 dBm	1 MHz

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 100 kHz filter is at Δf equals to 5.05 MHz; the last is at Δf equals to 14.95 MHz. The first measurement position with a 1 MHz filter is at Δf equals to 15.5 MHz; the last is at Δf equals to 24.5 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

2.9 Spectrum emission mask for FDD equipment operating in the band 1 710-1 785/1 805-1 880 MHz (BCG 6.C)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the base station centre frequency for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

Tables 99 and 100 specify the spectrum emissions for FDD base stations with 5 and 10 MHz channel bandwidths.

TABLE 99

Spectrum emission mask for 5 MHz carrier

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.515 to < 2.715	30	-14
2.715 to < 3.515	30	$-14-15(\Delta f-2.715)$
3.515 to < 4.0	30	-26
4.0 to ≤ 12.5	1 000	-13

TABLE 100

Spectrum emission mask for 10 MHz carrier

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5.015 to < 5.215	30	-14
5.215 to < 6.015	30	-14-15($\Delta f-52.2715$)
6.015 to < 6.5	30	-26
6.5 to < 15.50	1 000	-13
15.50 to \leq 25.0	1 000	-15

2.10 Spectrum emission mask for TDD equipment operating in the band 698-862 MHz (BCG 7.A)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz carrier, between 3.5 MHz and 17.5 MHz away for the 7 MHz carrier, and between 5 MHz and 25 MHz away for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

Tables 101, 102, 103, 104, 105 and 106 specify the spectrum emissions for TDD base stations with 5, 7 and 10 MHz channel bandwidths.

TABLE 101

Spectrum emission mask for 5 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 2.6	30	-13
2.6 to \leq 12.5	100	-13

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 2.650 MHz; the last is at Δf equals to 12.450 MHz.

TABLE 102

Spectrum emission mask for 7 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
3.5 to < 3.6	30	-13
3.6 to \leq 17.5	100	-13

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 3.515 MHz; the last is at Δf equals to 3.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 3.650 MHz; the last is at Δf equals to 17.450 MHz.

TABLE 103

Spectrum emission mask for 10 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5.0 to < 5.1	30	-13
5.1 to \leq 25.0	100	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 5.150 MHz; the last is at Δf equals to 24.950 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

TABLE 104

Spectrum emission mask for 5 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 7.5	100	$-7-7(\Delta f-2.55)/5$
7.5 to \leq 12.5	100	-14

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 2.650 MHz; the last is at Δf equals to 12.450 MHz.

TABLE 105

Spectrum emission mask for 7 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
3.5 to < 7	100	$-7-7(\Delta f-5.05)/5$
7 to < 10.5	100	-14
10.5 to \leq 17.5	1 000	-13

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 3.515 MHz; the last is at Δf equals to 3.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 3.650 MHz; the last is at Δf equals to 17.450 MHz.

TABLE 106

Spectrum emission mask for 10 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5 to < 10	100	$-7-7(\Delta f-5.05)/5$
10 to < 15	100	-14
15 to \leq 25	1 000	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 5.150 MHz; the last is at Δf equals to 24.950 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

2.11 Spectrum emission mask for FDD equipment operating in the band 776-787/746-757 MHz (BCG 7.B)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the base station centre frequency for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

Tables 107, 108, 109 and 110 specify the spectrum emissions for FDD base stations with 5 and 10 MHz channel bandwidths.

TABLE 107

Spectrum emission mask for 5 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 2.6	30	-13
2.6 to \leq 12.5	100	-13

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 2.650 MHz; the last is at Δf equals to 12.450 MHz.

TABLE 108

Spectrum emission mask for 10 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5.0 to < 5.1	30	-13
5.1 to \leq 25.0	100	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 5.150 MHz; the last is at Δf equals to 24.950 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

TABLE 109

Spectrum emission mask for 5 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 7.5	100	$-7-7(\Delta f-2.55)/5$
7.5 to \leq 12.5	100	-14

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 2.650 MHz; the last is at Δf equals to 12.450 MHz.

TABLE 110

Spectrum emission mask for 10 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5 to < 10	100	$-7-7(\Delta f-5.05)/5$
10 to < 15	100	-14
15 to \leq 25	1 000	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 5.150 MHz; the last is at Δf equals to 24.950 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

2.12 Spectrum emission mask for FDD equipment operating in the band 788-793/758-763 and 793-798/763-768 MHz (BCG 7.C)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz. Δf is defined as the frequency offset in MHz from the channel centre frequency.

Tables 111 and 112 specify the spectrum emissions for FDD base stations with 5 channel bandwidth.

TABLE 111

Spectrum emission mask for 5 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 2.6	30	-13
2.6 to \leq 12.5	100	-13

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 2.650 MHz; the last is at Δf equals to 12.450 MHz.

TABLE 112

Spectrum emission mask for 5 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 7.5	100	$-7-7(\Delta f-2.55)/5$
7.5 to \leq 12.5	100	-14

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 2.650 MHz; the last is at Δf equals to 12.450 MHz.

2.13 Spectrum emission mask for FDD equipment operating in the band 788-798/758-768 MHz (BCG 7.D)

The spectrum emission mask of base stations applies to frequency offsets between 5 MHz and 25 MHz away from the base station centre frequency for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

Tables 113 and 114 specify the spectrum emissions for FDD base stations with 5 and 10 MHz channel bandwidths.

TABLE 113

Spectrum emission mask for 10 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5.0 to < 5.1	30	-13
5.1 to \leq 25.0	100	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 5.150 MHz; the last is at Δf equals to 24.950 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

TABLE 114

Spectrum emission mask for 10 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5 to < 10	100	$-7-7(\Delta f-5.05)/5$
10 to < 15	100	-14
15 to \leq 25	1 000	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 5.150 MHz; the last is at Δf equals to 24.950 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

2.14 Spectrum emission mask for TDD and FDD equipment operating in the band 698-862 MHz (BCG 7.E)

The spectrum emission mask of base stations applies to frequency offsets between 2.5 MHz and 12.5 MHz away from the base station centre frequency for the 5 MHz carrier, between 3.5 MHz and 17.5 MHz for the 7 MHz carrier, and between 5 MHz and 25 MHz away for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

Tables 115 to 121 specify the spectrum emissions for TDD base stations with 5, 7 and 10 MHz channel bandwidths.

TABLE 115

Spectrum emission mask for 5 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 2.6	30	-13
2.6 to \leq 12.5	100	-13

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 2.650 MHz; the last is at Δf equals to 12.450 MHz.

TABLE 116

Spectrum emission mask for 7 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
3.5 to < 3.6	30	-13
3.6 to \leq 17.5	100	-13

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 3.515 MHz; the last is at Δf equals to 3.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 3.650 MHz; the last is at Δf equals to 17.450 MHz.

TABLE 117

Spectrum emission mask for 10 MHz carrier-US

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5.0 to < 5.1	30	-13
5.1 to \leq 25.0	100	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 5.150 MHz; the last is at Δf equals to 24.950 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

TABLE 118

Spectrum emission mask for 5 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
2.5 to < 7.5	100	$-7-7(\Delta f-2.55)/5$
7.5 to ≤ 12.5	100	-14

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 2.650 MHz; the last is at Δf equals to 12.450 MHz.

TABLE 119

Spectrum emission mask for 7 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
3.5 to < 7	100	$-7-7(\Delta f-5.05)/5$
7 to < 10.5	100	-14
10.5 to ≤ 17.5	1 000	-13

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 3.515 MHz; the last is at Δf equals to 3.585 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 3.650 MHz; the last is at Δf equals to 17.450 MHz.

TABLE 120

Spectrum emission mask for 10 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/Integration bandwidth) as measured at the antenna port
5 to < 10	100	$-7-7(\Delta f-5.05)/5$
10 to < 15	100	-14
15 to ≤ 25	1 000	-13

NOTE 1 – Δf is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The first measurement position with a 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at Δf equals to 5.150 MHz; the last is at Δf equals to 24.950 MHz.

NOTE 3 – Integration bandwidth refers to the frequency range over which the emission power is integrated.

2.15 Spectrum emission mask for FDD equipment operating in the band 880-915/925-960 MHz (BCG 7.G)

The spectrum emission mask of base stations applies to frequency offsets between 5 MHz and 25 MHz away from the base station centre frequency for the 10 MHz carrier. Δf is defined as the frequency offset in MHz from the channel centre frequency.

Tables 121 and 122 specify the spectrum emissions for FDD base stations with 5 and 10 MHz channel bandwidths.

TABLE 121

Spectrum emission mask for 5 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
2.515 to < 2.715	30	-14
2.715 to < 3.515	30	$-14-15(\Delta f-2.715)$
3.515 to < 4.0	30	-26
4.0 to ≤ 12.5	1 000	-13

TABLE 122

Spectrum emission mask for 10 MHz carrier-Europe

Offset Δf from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
5.015 to < 5.215	30	-14
5.215 to < 6.015	30	$-14-15(\Delta f-5.215)$
6.015 to < 6.5	30	-26
6.5 to < 15.50	1 000	-13
15.50 to ≤ 25.0	1 000	-15

3 Transmitter spurious emissions (conducted)

IMT-2000 OFDMA TDD WMAN base stations comply with the limits recommended in Recommendation ITU-R SM.329-10.

3.1 Default spurious emissions

Unless otherwise specified in subsections of § 3 for specific bands, the default spurious emission specifications of Table 123 are applicable.

TABLE 123

Default spurious emission

Spurious frequency (f) range	Measurement bandwidth	Maximum emission level (dBm)
$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	100 kHz	-36
$1 \text{ GHz} \leq f < 5 \times F_{ue}$	30 kHz If $2.5 \times \text{ChBW} \leq \Delta f < 10 \times \text{ChBW}$ 300 kHz If $10 \times \text{ChBW} \leq \Delta f < 12 \times \text{ChBW}$ 1 MHz If $12 \times \text{ChBW} \leq \Delta f$	-30

3.2 Spurious emissions for TDD equipment operating in the band 2 300-2 400 MHz (BCG 1.A/1.B)

The limits shown in Tables 124 and 125 are only applicable for frequency offsets which are greater than 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and greater than 25 MHz for the 10 MHz carrier. f is the frequency of the spurious domain emissions. f_c is the base station centre frequency.

TABLE 124

Spurious emission limit, Category A

Band	Allowed emission level	Measurement bandwidth	Note
30 MHz-1 GHz	-13 dBm	100 kHz	Bandwidth as in Recommendation ITU-R SM.329-10, § 4.1
1 GHz-13.45 GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329-10, § 2.5, Table 1

TABLE 125

Spurious emissions limit, Category B

Band	Measurement bandwidth	Allowed emission level
$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36 dBm
$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36 dBm
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	100 kHz	-36 dBm
$1 \text{ GHz} \leq f < 13.45 \text{ GHz}$	30 kHz If $2.5 \times \text{BW} \leq f_c - f < 10 \times \text{BW}$ 300 kHz If $10 \times \text{BW} \leq f_c - f < 12 \times \text{BW}$ 1 MHz If $12 \times \text{BW} \leq f_c - f $	-30 dBm

NOTE 1 – In Table 125, BW is the signal channel bandwidth of 5 or 10 MHz.

For a channel bandwidth of 8.75 MHz, Table 124 applies.

TABLE 126

**Additional spurious emissions for 5 MHz channel size;
relevant to $2\,302.5 \leq f_c \leq 2\,397.5$ (BCG 1.B)**

No	Spurious frequency (f) range (MHz)	Measurement bandwidth (MHz)	Maximum emission level (dBm)
1	$876 \leq f < 915$	1	-51
2	$921 \leq f < 925$	1	-47
3	$925 \leq f < 960$	1	-52
4	$1\,710 \leq f < 1\,785$	1	-51
5	$1\,805 \leq f < 1\,880$	1	-52
6	$1\,920 \leq f < 1\,980$	1	-49
7	$2\,110 \leq f < 2\,170$	1	-52
8	$1\,900 \leq f < 1\,920$	1	-52
9	$2\,010 \leq f < 2\,025$	1	-52
10	$2\,500 \leq f < 2\,570$	1	-49
11	$2\,570 \leq f < 2\,620$	1	-52
12	$2\,620 \leq f < 2\,690$	1	-52

TABLE 127

**Additional spurious emissions for 10 MHz channel size;
relevant to $2\,305 \leq f_c \leq 2\,395$ (BCG 1.B)**

No	Spurious frequency (f) range (MHz)	Measurement bandwidth (MHz)	Maximum emission level (dBm)
1	$876 \leq f < 915$	1	-51
2	$921 \leq f < 960$	1	-47
3	$925 \leq f < 960$	1	-52
4	$1\,710 \leq f < 1\,785$	1	-51
5	$1\,805 \leq f < 1\,880$	1	-52
6	$1\,920 \leq f < 1\,980$	1	-49
7	$2\,110 \leq f < 2\,170$	1	-52
8	$1\,900 \leq f < 1\,920$	1	-52
9	$2\,010 \leq f < 2\,025$	1	-52
10	$2\,500 \leq f < 2\,570$	1	-49
11	$2\,570 \leq f < 2\,620$	1	-52
12	$2\,620 \leq f < 2\,690$	1	-52

3.3 Spurious emissions for TDD equipment operating in the band 2 500-2 690 MHz (BCG 3.A)

The limits shown in Tables 128 and 129 are only applicable for frequency offsets which are greater than 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and greater than 25 MHz for the 10 MHz carrier. f is the frequency of the spurious domain emissions. f_c is the base station centre frequency.

The emission levels in Table 128 should be met in areas where Category A limits for spurious emissions, as defined in Recommendation ITU-R SM.329-10, are applicable. The emission levels in Table 12 should be met in areas where Category B limits for spurious emissions, as defined in Recommendation ITU-R SM.329-10, are applicable.

TABLE 128

Spurious emission limit, Category A

Band	Allowed emission level	Measurement bandwidth	Note
30 MHz-1 GHz	-13 dBm	100 kHz	Bandwidth as in Recommendation ITU-R SM.329-10, § 4.1
1-13.45 GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329-10, § 2.5, Table 1

TABLE 129

Spurious emissions limit, Category B

Band	Measurement bandwidth	Allowed emission level
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	100 kHz	-36 dBm
$1 \text{ GHz} \leq f < 13.45 \text{ GHz}$	30 kHz If $2.5 \times \text{BW} \leq f_c - f < 10 \times \text{BW}$ 300 kHz If $10 \times \text{BW} \leq f_c - f < 12 \times \text{BW}$ 1 MHz If $12 \times \text{BW} \leq f_c - f $	-30 dBm

NOTE – In Table 129, BW is the signal channel bandwidth of 5 or 10 MHz.

TABLE 130

Spurious emission limit, Japan

Frequency bandwidth	Measurement bandwidth	Allowed emission level (dBm)
$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-13
$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-13
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	100 kHz	-13
$1\,000 \text{ MHz} \leq f < 2\,505 \text{ MHz}$	1 MHz	-13
$2\,505 \text{ MHz} \leq f < 2\,535 \text{ MHz}$	1 MHz	-42
$2\,535 \text{ MHz} \leq f < 2\,630 \text{ MHz}$	1 MHz	-13 ⁽¹⁾
$2\,630 \text{ MHz} \leq f < 2\,634.75 \text{ MHz}$	1 MHz	$-15 - 7/5 \times (f - 2\,629.75)$
$2\,634.75 \text{ MHz} \leq f < 2\,655 \text{ MHz}$	1 MHz	-22
$2\,655 \text{ MHz} \leq f$	1 MHz	-13

⁽¹⁾ The allowed emission level for the frequency band between 2 535 MHz and 2 630 MHz shall be applied for the frequency range greater than 2.5 times the channel size from the centre frequency.

3.4 Spurious emission for FDD equipment operating in the band 2 496-2 572/2 614-2 690 MHz (BCG 3.B)

Spurious emission limits are applicable to frequency offset which are greater than 250% of the channel bandwidth. Therefore the limits shown in Tables 131 to 136 are only applicable for frequency offsets which are greater than 12.5 MHz away from the base station centre frequency for the 5 MHz carrier, greater than 17.5 MHz away from the base station centre frequency for the 7 MHz carrier, and greater than 25 MHz for the 10 MHz carrier. f is the frequency of the spurious domain emissions. f_c is the base station centre frequency.

In all of the following tables, measurement uncertainty (as defined in Recommendation ITU-R M.1545) values corresponding to spurious emission limits have not been included here.

TABLE 131

Spurious emission limit for 5 MHz carrier – US; relevant to $2\ 616.5 \leq f_c \leq 2\ 687.5$

Measurement frequency range	Measurement bandwidth (MHz)	Maximum emission level (dBm)
$30\ \text{MHz} < f < 13.450\ \text{GHz}$, $12.5\ \text{MHz} \leq \Delta f$	1	-13

TABLE 132

Spurious emission limit for 10 MHz carrier – US; relevant to $2\ 619 \leq f_c \leq 2\ 685$

Measurement frequency range	Measurement bandwidth (MHz)	Maximum emission level (dBm)
$30\ \text{MHz} < f < 13.450\ \text{GHz}$, $25\ \text{MHz} \leq \Delta f$	1	-13

TABLE 133

Spurious emission limit for 5 MHz carrier – Europe; relevant to $2\ 616.5 \leq f_c \leq 2\ 687.5$

Spurious frequency (f) range	Measurement bandwidth	Maximum emission level (dBm)
$9\ \text{kHz} \leq f < 150\ \text{kHz}$	1 kHz	-36
$150\ \text{kHz} \leq f < 30\ \text{MHz}$	10 kHz	-36
$30\ \text{MHz} \leq f < 1\ 000\ \text{MHz}$	100 kHz	-36
$1\ \text{GHz} \leq f < 13450\ \text{MHz}$	30 kHz If $12.5\ \text{MHz} \leq \Delta f < 50\ \text{MHz}$ 300 kHz If $50\ \text{MHz} \leq \Delta f < 60\ \text{MHz}$ 1 MHz If $60\ \text{MHz} \leq \Delta f$	-30

TABLE 134

Spurious emission limit for 10 MHz carrier – Europe; relevant to $2\,619 \leq f_c \leq 2\,685$

Spurious frequency (f) range	Measurement bandwidth	Maximum emission level (dBm)
$9\text{ kHz} \leq f < 150\text{ kHz}$	1 kHz	-36
$150\text{ kHz} \leq f < 30\text{ MHz}$	10 kHz	-36
$30\text{ MHz} \leq f < 1\,000\text{ MHz}$	100 kHz	-36
$1\text{ GHz} \leq f < 13\,450\text{ MHz}$	30 kHz If $25\text{ MHz} \leq \Delta f < 100\text{ MHz}$ 300 kHz If $100\text{ MHz} \leq \Delta f < 120\text{ MHz}$ 1 MHz If $120\text{ MHz} \leq \Delta f$	-30

TABLE 135

Spurious emission limit for 5 MHz carrier – Europe; relevant to $2\,616.5 \leq f_c \leq 2\,687.5$

Spurious frequency (f) range (MHz)	Measurement bandwidth	Maximum level
2 496-2 572	100 kHz	-96 dBm

TABLE 136

Spurious emission limit for 10 MHz carrier– Europe; relevant to $2\,619 \leq f_c \leq 2\,685$

Spurious frequency (f) range (MHz)	Measurement bandwidth	Maximum level
2 496-2 572	100 kHz	-96 dBm

3.5 Spurious emissions for TDD equipment operating in the band 3 400-3 600 MHz (BCG 5L.A/5L.B/5L.C)

Spurious emission limits are applicable to frequency offset which are greater than 250% of the channel bandwidth. Therefore the limits shown in Tables 137 and 138 are only applicable for frequency offsets which are greater than 12.5 MHz away from the base station centre frequency for the 5 MHz carrier, greater than 17.5 MHz away from the base station centre frequency for the 7 MHz carrier, and greater than 25 MHz for the 10 MHz carrier. f is the frequency of the spurious domain emissions. f_c is the base station centre frequency.

TABLE 137

Spurious emission limit, Category A

Band	Allowed emission level	Measurement bandwidth	Note
30 MHz-1 GHz	-13 dBm	100 kHz	Bandwidth as in Recommendation ITU-R SM.329-10, § 4.1
1 GHz-13.45 GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329-10, § 2.5, Table 1

TABLE 138

Spurious emissions limit, Category B

Band	Measurement bandwidth	Allowed emission level
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	100 kHz	-36 dBm
$1 \text{ GHz} \leq f < 13.45 \text{ GHz}$	30 kHz If $2.5 \times \text{BW} \leq f_c - f < 10 \times \text{BW}$	-30 dBm
	300 kHz If $10 \times \text{BW} \leq f_c - f < 12 \times \text{BW}$	
	1 MHz If $12 \times \text{BW} \leq f_c - f $	

NOTE 1 – In Table 138, BW is the signal channel bandwidth of 5, 7 or 10 MHz.

3.6 Spurious emission for TDD equipment operating in the band 3 600-3 800 MHz (BCG 5H.A/5H.B/5H.C)

Spurious emission limits are applicable to frequency offset which are greater than 250% of the channel bandwidth. Therefore the limits shown in Tables 139 and 140 are only applicable for frequency offsets which are greater than 12.5 MHz away from the base station centre frequency for the 5 MHz carrier, greater than 17.5 MHz away from the base station centre frequency for the 7 MHz carrier, and greater than 25 MHz for the 10 MHz carrier. f is the frequency of the spurious domain emissions. f_c is the base station centre frequency.

TABLE 139

Spurious emission limit, Category A

Band	Allowed emission level	Measurement bandwidth	Note
30 MHz-1 GHz	-13 dBm	100 kHz	Bandwidth as in Recommendation ITU-R SM.329-10, § 4.1
1 GHz-13.45 GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329-10, § 2.5, Table 1

TABLE 140

Spurious emissions limit, Category B

Band	Measurement bandwidth	Allowed emission level
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	100 kHz	-36 dBm
$1 \text{ GHz} \leq f < 13.45 \text{ GHz}$	30 kHz If $2.5 \times \text{BW} \leq f_c - f < 10 \times \text{BW}$	-30 dBm
	300 kHz If $10 \times \text{BW} \leq f_c - f < 12 \times \text{BW}$	
	1 MHz If $12 \times \text{BW} \leq f_c - f $	

NOTE – In Table 140, BW is the signal channel bandwidth of 5, 7 or 10 MHz.

3.7 Spurious emission for FDD equipment operating in the band 1 710-1 770/2 110-2 170 MHz (BCG 6.A)

The limits shown in Tables 141 and 142 are only applicable for frequency offsets which are greater than 12.5 MHz away from the base station centre frequency for the 5 MHz carrier and greater than 25 MHz for the 10 MHz carrier. f is the frequency of the spurious domain emissions. f_c is the base station centre frequency.

In Tables 141 and 142, measurement uncertainty (as defined in Recommendation ITU-R M.1545) values corresponding to spurious emission limits have not been included.

TABLE 141

Spurious emissions for 5 MHz channel size; relevant to 2 112.5 MHz $\leq f_c \leq$ 2 152.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	$30 \text{ MHz} \leq f < 10.775 \text{ GHz}$, $12.5 \text{ MHz} \leq \Delta f $	1 MHz	-13

TABLE 142

Spurious emissions for 5 MHz channel size; relevant to 2 115 MHz $\leq f_c \leq$ 2 150 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	$30 \text{ MHz} \leq f < 10.775 \text{ GHz}$, $25 \text{ MHz} \leq \Delta f $	1 MHz	-13

3.8 Spurious emissions for FDD equipment operating in the band 1 920-1 980/2 110-2 170 MHz (BCG 6.B)

The limits shown in Tables 143 to 146 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Tables $|\Delta f|$ is $f_c - f$, where f is the frequency of the spurious domain emissions and f_c is the mobile station transmit centre frequency. All spurious emission specifications are of conducted type.

Tables 143 and 144 specify the spurious emission for FDD base stations with 5 and 10 MHz channel bandwidths, while Tables 145 and 146 specify the additional spurious emission limits for 5 and 10 MHz channel bandwidths.

TABLE 143

Spurious emissions for 5 MHz channel size; relevant to 2 112.5 MHz $\leq f_c \leq$ 2 167.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 9.9 \text{ GHz}$, $12.5 \leq \Delta f $	1 MHz	-30

TABLE 144

Spurious emissions for 10 MHz channel size; relevant to $2\ 115\ \text{MHz} \leq f_c \leq 2\ 165\ \text{MHz}$

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	$9\ \text{kHz} \leq f < 150\ \text{kHz}$	1 kHz	-36
2	$150\ \text{kHz} \leq f < 30\ \text{MHz}$	10 kHz	-36
3	$30\ \text{MHz} \leq f < 1\ 000\ \text{MHz}$	100 kHz	-36
4	$1\ \text{GHz} \leq f < 19\ \text{GHz}, 25 \leq \Delta f $	1 MHz	-30

TABLE 145

Additional spurious emissions for 5 MHz channel size; relevant to $2\ 112.5\ \text{MHz} \leq f_c \leq 2\ 167.5\ \text{MHz}$

Row	Spurious frequency (f) range (MHz)	Measurement bandwidth	Minimum requirement (dBm)
1	921-960	100 kHz	-57
2	876-915	100 kHz	-61
3	1 805-1 880	100 kHz	-47
4	1 710-1 785	100 kHz	-61
5	1 930-1 990	100 kHz	-47
6	1 850-1 910	100 kHz	-61
7	869-894	100 kHz	-57
8	824-849	100 kHz	-61
9	1 930-1 990	1 MHz	-52
11	1 850-1 910	1 MHz	-49
12	1 805-1 880	1 MHz	-52
13	1 710-1 785	1 MHz	-49
14	2 110-2 155	1 MHz	-52
15	1 710-1 755	1 MHz	-49
16	869-894	1 MHz	-52
17	824-849	1 MHz	-49
18	860-895	1 MHz	-52
19	815-850	1 MHz	-49
20	2 620-2 690	1 MHz	-52
21	2 500-2 570	1 MHz	-49
22	925-960	1 MHz	-52
23	880-915	1 MHz	-49
24	1 844.9-1 879.9	1 MHz	-52
25	1 749.9-1 784.9	1 MHz	-49
26	2 110-2 170	1 MHz	-52

TABLE 145 (end)

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)
27	1 710-1 770	1 MHz	-49
28	1 475.9-1 500.9	1 MHz	-52
29	1 427.9-1 452.9	1 MHz	-49
30	728-746	1 MHz	-52
31	698-716	1 MHz	-49
32	746-756	1 MHz	-52
33	777-787	1 MHz	-49
34	758-768	1 MHz	-52
35	788-798	1 MHz	-49
36	1 900-1 920	1 MHz	-52
37	2 010-2 025	1 MHz	-52
38	1 850-1 910	1 MHz	-52
39	1 930-1 990	1 MHz	-52
40	1 910-1 930	1 MHz	-52
41	2 570-2 620	1 MHz	-52
42	1 880-1 920	1 MHz	-52

TABLE 146

Additional spurious emissions for 10 MHz channel size; relevant to
 $2\ 115\ \text{MHz} \leq f_c \leq 2\ 165\ \text{MHz}$

Row	Spurious frequency (f) range (MHz)	Measurement bandwidth	Minimum requirement (dBm)
1	921-960	100 kHz	-57
2	876-915	100 kHz	-61
3	1 805-1 880	100 kHz	-47
4	1 710-1 785	100 kHz	-61
5	1 930-1 990	100 kHz	-47
6	1 850-1 910	100 kHz	-61
7	869-894	100 kHz	-57
8	824-849	100 kHz	-61
9	1 930-1 990	1 MHz	-52
11	1 850-1 910	1 MHz	-49
12	1 805-1 880	1 MHz	-52
13	1 710-1 785	1 MHz	-49
14	2 110-2 155	1 MHz	-52
15	1 710-1 755	1 MHz	-49
16	869-894	1 MHz	-52

TABLE 146 (end)

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)
17	824-849	1 MHz	-49
18	860-895	1 MHz	-52
19	815-850	1 MHz	-49
20	2 620-2 690	1 MHz	-52
21	2 500-2 570	1 MHz	-49
22	925-960	1 MHz	-52
23	880-915	1 MHz	-49
24	1 844.9-1 879.9	1 MHz	-52
25	1 749.9-1 784.9	1 MHz	-49
26	2 110-2 170	1 MHz	-52
27	1 710-1 770	1 MHz	-49
28	1 475.9-1 500.9	1 MHz	-52
29	1 427.9-1 452.9	1 MHz	-49
30	728-746	1 MHz	-52
31	698-716	1 MHz	-49
32	746-756	1 MHz	-52
33	777-787	1 MHz	-49
34	758-768	1 MHz	-52
35	788-798	1 MHz	-49
36	1 900-1 920	1 MHz	-52
37	2 010-2 025	1 MHz	-52
38	1 850-1 910	1 MHz	-52
39	1 930-1 990	1 MHz	-52
40	1 910-1 930	1 MHz	-52
41	2 570-2 620	1 MHz	-52
42	1 880-1 920	1 MHz	-52

3.9 Spurious emissions for FDD equipment operating in the band 1 710-1 785/1 805-1 880 MHz (BCG 6.C)

The limits shown in Tables 147 to 148 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the base station centre frequency. In the Tables $|\Delta f|$ is $f_c - f$, where f is the frequency of the spurious domain emissions and f_c is the base station transmit centre frequency. All spurious emission specifications are of conducted type.

Tables 147 and 148 specify the spurious emission for FDD base stations with 5 and 10 MHz channel bandwidths.

TABLE 147

Spurious emissions

Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range	Integration bandwidth	Maximum emission level (dBm)
1 805-1 880	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
1 805-1 880	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
1 805-1 880	$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	100 kHz	-36
1 805-1 880	$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	30 kHz, If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz, If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz, If $60 \text{ MHz} \leq \Delta f$	-30

TABLE 148

Spurious emissions limits for protection of the BS receiver

Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range (MHz)	Measurement bandwidth	Maximum level (dBm)
1 805-1 880	1 710-1 785	100 kHz	-96

TABLE 149

Additional spurious emission limits

No	Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range (MHz)	Measurement bandwidth	Maximum emission level (dBm)
1	1 805-1 880	1 805-1 880	100 kHz	47
2		1 710-1 785	100 kHz	-61
		1 805-1 880	1 MHz	-52
		1 710-1 785	1 MHz	-49

3.10 Spurious emissions for FDD equipment operating in the band 880-915/925-960 MHz (BCG 7.G)

The limits shown in Tables 150 to 151 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the base station centre frequency. In the Tables $|\Delta f|$ is $f_c - f$, where f is the frequency of the spurious domain emissions and f_c is the base station transmit centre frequency. All spurious emission specifications are of conducted type.

Tables 150 to 151 specify the spurious emission for FDD base stations with 5 and 10 MHz channel bandwidths.

TABLE 150

Spurious emissions

Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range	Integration bandwidth	Maximum emission level (dBm)
925-960	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
925-960	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
925-960	$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	100 kHz	-36
925-960	$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	30 kHz, If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz, If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz, If $60 \text{ MHz} \leq \Delta f$	-30

Table 150 specifies limits to protect BS receivers against its intra-system BS transmit emissions.

TABLE 151

Spurious emission limits for protection of the BS receiver

Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range (MHz)	Measurement bandwidth	Maximum level (dBm)
925-960	880-915	100 kHz	-96

The spurious emission limits specified in Table 151 may be required by local or regional regulations.

TABLE 152

Additional spurious emission (BCG 7.G)

No	Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range (MHz)	Measurement bandwidth (MHz)	Maximum emission level (dBm)
3	925-960	880-915	1 MHz	-52
		925-960	1 MHz	-49

3.11 Coexistence with other systems in the same geographical/service area

These requirements may be applied for the protection of UE, MS and/or BS operating in other frequency bands in the same geographical area. The requirements may apply in geographical/service areas as applicable in which both OFDMA-TDD-WMAN and a system operating in another frequency band than the OFDMA-TDD-WMAN operating band are deployed. The systems operating in the other frequency band may be GSM900, DCS1800, PCS1900, GSM850, PHS, UTRA-TDD (3.84 Mchip/s, 7.68 Mchip/s, 1.28 Mchip/s options) and UTRA-FDD.

The power of any spurious emission should not exceed the limits of Table 152 for a BS where requirements for coexistence with the system listed in the first column apply.

TABLE 153

**BS spurious emission limits for OFDMA-TDD-WMAN BS in geographic coverage
area of systems operating in other frequency bands**

System type operating in the same geographical area	Band for coexistence requirement	Maximum level (dBm)	Measurement bandwidth	Note
GSM900	921-960 MHz	-57	100 kHz	
	876-915 MHz	-61	100 kHz	
DCS1800	1 805-1 880 MHz	-47	100 kHz	
	1 710-1 785 MHz	-61	100 kHz	
PCS1900	1 930-1 990 MHz	-47	100 kHz	
	1 850-1 910 MHz	-61	100 kHz	
GSM850	869-894 MHz	-57	100 kHz	
	824-849 MHz	-61	100 kHz	
PHS	1 884.5-1 919.6 MHz	-41	300 kHz	
FDD Band I	2 110-2 170 MHz	-52	1 MHz	
	1 920-1 980 MHz	-49	1 MHz	
FDD Band II	1 930-1 990 MHz	-52	1 MHz	
	1 850-1 910 MHz	-49	1 MHz	
FDD Band III	1 805-1 880 MHz	-52	1 MHz	
	1 710-1 785 MHz	-49	1 MHz	
FDD Band IV	2 110-2 155 MHz	-52	1 MHz	
	1 710-1 755 MHz	-49	1 MHz	
FDD Band V	869-894 MHz	-52	1 MHz	
	824-849 MHz	-49	1 MHz	
FDD Band VI	860-895 MHz	-52	1 MHz	
	815-850 MHz	-49	1 MHz	
FDD Band VII	2 620-2 690 MHz	-52	1 MHz	This requirement does not apply to OFDMA TDD WMAN operating in Band VII
	2 500-2 570 MHz	-49	1 MHz	This requirement does not apply to OFDMA TDD WMAN operating in Band VII
FDD Band VIII	925-960 MHz	-52	1 MHz	
	880-915 MHz	-49	1 MHz	
FDD Band IX	1 844.9-1 879.9 MHz	-52	1 MHz	
	1 749.9-1 784.9 MHz	-49	1 MHz	
FDD Band X	2 110-2 170 MHz	-52	1 MHz	
	1 710-1 770 MHz	-49	1 MHz	
UTRA-TDD	1 900-1 920 MHz	-52	1 MHz	
	2 010-2 025 MHz	-52	1 MHz	
	2 300-2 400 MHz	-52	1 MHz	This requirement does not apply to OFDMA TDD WMAN operating in the band 2 300-2 400 MHz
	2 570-2 610 MHz	-52	1 MHz	This requirement does not apply to OFDMA TDD WMAN operating in the band 2 500-2 690 MHz

NOTE 1 – The values in this Table are considered as preliminary values only, and are subject to further study that could lead to a revision of this Recommendation.

4 Receiver spurious emissions (conducted)

The receiver spurious emissions in Table 154 are applied in Japan.

TABLE 154

Receiver spurious emission requirements

Frequency band	Total allowed emission level (dBm)
$f < 1$ GHz	-54
$1 \text{ GHz} \leq f$	-47

5 Adjacent channel leakage ratio (ACLR)

5.1 ACLR values for TDD equipment operating in the band $2\,302.5 \leq f_c \leq 2\,397.5$ (BCG 1.B)

For 5 and 10 MHz BW Band Class Group 1.B, the ACLR shall be equal to or greater than the limits specified in the tables below.

TABLE 155

ACLR specification for 5 MHz channel BW (BCG 1.B)

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	BS channel centre frequency ± 5 MHz	45
2	BS channel centre frequency ± 10 MHz	50

TABLE 156

ACLR specifications for 10 MHz channel BW (BCG 1.B)

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	BS channel centre frequency ± 10 MHz	45
2	BS channel centre frequency ± 20 MHz	50

In Tables 155 and 156, the measurement bandwidth centred on the adjacent channel is 4.75 MHz for a 5 MHz channelized system and 9.5 MHz for a 10 MHz channelized system.

5.2 ACLR values for TDD equipment operating in the band 2 500-2 690 MHz (BCG 3.A)

Within this Annex, and in a similar manner to other annexes, the ACLR is defined as the ratio of the on-channel transmitted power to the power transmitted in adjacent channels as measured at the output of the receiver filter. In order to measure ACLR it is necessary to consider a measurement filter for the transmitted signal as well as a receiver measurement bandwidth for the adjacent channel (victim) system.

5.3 Inter-system and intra-system scenarios

There are two specific coexistence requirements that must be considered; the intra-system and inter-system. In this section only the following scenarios are considered:

- OFDMA TDD WMAN adjacent to OFDMA TDD WMAN within the same network;
- OFDMA TDD WMAN adjacent to UTRA technologies, which might operate using FDD or unsynchronized TDD techniques. The ACLR in this case also takes into account the boundary coexistence conditions between an OFDMA TDD WMAN system and a UTRA system, which could happen in the case of deployments in adjacently assigned spectrum blocks.

In this text, only one inter-system scenario is discussed, that pertaining to UTRA. Two classes of ACLR figures are defined in this Annex to describe the two relevant scenarios as follows.

Intra-system scenario: A classification that identifies a level of minimum required ACLR performance generally appropriate for intra-system operation in contiguous channel assignments within the same network, i.e. OFDMA TDD WMAN adjacent to OFDMA TDD WMAN. In this Annex, intra-system ACLR is based on the following receiver bandwidths with the OFDMA TDD WMAN system operated on-channel and adjacent channel:

- 4.75 MHz for a 5 MHz channelized system, and
- 9.5 MHz for a 10 MHz channelized system.

UTRA scenario: A classification that identifies a level of minimum required ACLR performance appropriate for more demanding interoperator/coexistence scenarios at adjacent frequency block boundaries.

The following receiver bandwidths are assumed for the UTRA system:

- 3.84 MHz for a 5 MHz channelized system, and
- 7.68 MHz for a 10 MHz channelized system.

In each scenario, the passband of the receiver filter is centred on the first or second adjacent channel centre frequency. In the case where the adjacent system is OFDMA TDD WAN, both the transmitted power and the received power are measured with a rectangular filter. For adjacent UTRA systems the transmitted power is measured using a rectangular filter and the received power using a RRC filter with a roll-off factor of 0.22.

The ACLR values for the two relevant scenarios are provided in the following tables.

TABLE 157

a) ACLR for 5 MHz channel bandwidth – intra-system scenario

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 5 MHz	45
BS channel centre frequency \pm 10 MHz	55

b) ACLR for 5 MHz channel bandwidth – UTRA scenario

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 5 MHz	53.5
BS channel centre frequency \pm 10 MHz	66

TABLE 157 (*end*)**c) ACLR for 10 MHz channel bandwidth – intra-system scenario**

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 10.0 MHz	45
BS channel centre frequency \pm 20.0 MHz	55

d) ACLR for 10 MHz channel bandwidth – UTRA scenario

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 10.0 MHz	53.5
BS channel centre frequency \pm 20.0 MHz	66

5.4 ACLR values for TDD equipment operating in the band 3 400-3 600 MHz (BCG 5L.A/5L.B/5L.C)

The ACLR is the ratio of the transmitted mean power measured through a filter pass band centred on the assigned channel frequency to the transmitted mean power measured through a bandpass filter centred on a first or second adjacent channel. The first adjacent and second adjacent channel centre offsets relative to the assigned channel centre frequency respectively equal the channel bandwidth and twice the channel bandwidth.

The ACLR limits for systems with 5, 7 and 10 MHz channel bandwidths operating in the band 3 400-3 600 MHz are specified in Table 158.

TABLE 158

a) ACLR for 5 MHz channel bandwidth

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 5 MHz	37
BS channel centre frequency \pm 10 MHz	48

b) ACLR for 7 MHz channel bandwidth

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 7 MHz	37
BS channel centre frequency \pm 14 MHz	48

c) ACLR for 10 MHz channel bandwidth

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 10.0 MHz	37
BS channel centre frequency \pm 20.0 MHz	48

Additional information may be provided in future revisions of this Recommendation.

NOTE 1 – Further study is necessary for other systems wherever applicable.

5.5 ACLR values for TDD equipment operating in the band 3 600-3 800 MHz (BCG 5H.A/5H.B/5H.C)

The ACLR is the ratio of the transmitted mean power measured through a filter pass band centred on the assigned channel frequency to the transmitted mean power measured through a bandpass filter centred on a first or second adjacent channel. The first adjacent and second adjacent channel centre offsets relative to the assigned channel centre frequency respectively equal the channel bandwidth and twice the channel bandwidth.

The ACLR limits for systems with 5, 7 and 10 MHz channel bandwidths operating in the band 3 600-3 800 MHz are specified in Table 159.

TABLE 159

a) ACLR for 5 MHz channel bandwidth

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 5 MHz	37
BS channel centre frequency \pm 10 MHz	48

b) ACLR for 7 MHz channel bandwidth

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 7 MHz	37
BS channel centre frequency \pm 14 MHz	48

c) ACLR for 10 MHz channel bandwidth

Adjacent channel centre frequency	Minimum required ACLR (dB)
BS channel centre frequency \pm 10.0 MHz	37
BS channel centre frequency \pm 20.0 MHz	48

Additional information may be provided in future revisions of this Recommendation.

NOTE 1 – Further study is necessary for other systems wherever applicable.

5.6 ACLR values for FDD equipment operating in the band 1 710-1 785/1 805-1 880 MHz (BCG 6.C)

For 5 and 10 MHz BW Band Class Group 6.C, the ACLR shall be equal to or greater than the limits specified in Tables 160 and 161 below.

ACLR is specified when the receiver channel bandwidth on the adjacent channel is:

- 4.75 MHz for a 5 MHz channelized system; and
- 9.5 MHz for a 10 MHz channelized system.

The measurement bandwidth for the measurement of on-channel power of the Mobile WiMAX carrier is:

- 4.75 MHz for a 5 MHz channelized system; and
- 9.5 MHz for a 10 MHz channelized system.

In here, the transmitted power and the received power are measured with a rectangular filter. In Tables 160 and 161, the ACLR specifications are shown. Measurement uncertainty (as defined in Recommendation ITU-R M.1545) values corresponding to the ACLR limits have not been included.

TABLE 160

ACLR specification for 5 MHz channel BW BS (BCG 6.C)

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	BS channel centre frequency \pm 5 MHz	45
2	BS channel centre frequency \pm 10 MHz	50

TABLE 161

ACLR specifications for 10 MHz channel BW BS (BCG 6.C)

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	BS channel centre frequency \pm 10 MHz	45
2	BS channel centre frequency \pm 20 MHz	50

5.7 ACLR values for FDD equipment operating in the band 880-915/925-960 MHz (BCG 7.G)

For 5 and 10 MHz BW Band Class Group 6.C, the ACLR shall be equal to or greater than the limits specified in Tables 162 and 163 below.

ACLR is specified when the receiver channel bandwidth on the adjacent channel is:

- 4.75 MHz for a 5 MHz channelized system; and
- 9.5 MHz for a 10 MHz channelized system.

The measurement bandwidth for the measurement of on-channel power of the Mobile WiMAX carrier is:

- 4.75 MHz for a 5 MHz channelized system; and
- 9.5 MHz for a 10 MHz channelized system.

In here, the transmitted power and the received power are measured with a rectangular filter. In Tables 162 and 163, the ACLR specifications are shown. Measurement uncertainty (as defined in Recommendation ITU-R M.1545) values corresponding to the ACLR limits have not been included.

TABLE 162

ACLR specification for 5 MHz channel BW BS (BCG 7.G)

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	BS channel centre frequency \pm 5 MHz	45
2	BS channel centre frequency \pm 10 MHz	50

TABLE 163

ACLR specifications for 10 MHz channel BW BS (BCG 7.G)

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	BS channel centre frequency \pm 10 MHz	45
2	BS channel centre frequency \pm 20 MHz	50

6 Test tolerance

In this Annex, the test tolerances (as defined in Recommendation ITU-R M.1545) corresponding to various specifications are 0 dB unless stated otherwise in the corresponding section.

**Attachment
(to Annex 6)**

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.