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(03/2012)

Generic unwanted emission characteristics of mobile 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.1581-4*

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

(Question ITU-R 229-2/5)

(2002-2003-2007-2009-2012)

Summary of revision

Addition of one sentence to the scope. Deletion of *considering* m) and addition of *considering* n) and o). Addition of *noting* b) and c). Modifications to Note 2, Note 3, Note 4, Note 5 and addition of new Note 7. The annexes have also been updated. 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 "#".

Scope

This Recommendation provides the generic unwanted emission characteristics of mobile stations using the terrestrial radio interfaces of IMT-2000, suitable for establishing the technical basis for global circulation of IMT-2000 terminals. Implementation of characteristics of mobile 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 mobile stations (MSs) 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 size or in complexity of IMT-2000 radio equipment;

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 MSs 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 terminals shall comply with the limits specified in RR Appendix **3**;

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

j) that Recommendation ITU-R M.1579 establishes the technical basis for global circulation of IMT-2000 MSs;

k) that one of the basic requirements of global circulation is that the MS does not cause harmful interference in any country where it is taken;

l) that the harmonization of unwanted emission limits will facilitate global use and access to a global market;

m) that unwanted emission limits are dependent on the transmitter emission characteristics in addition to depending on services operating in other bands;

n) 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;

o) that harmonised 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 mobile 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

1 that the unwanted emission characteristics of IMT-2000 MSs 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 only defined for mobile stations 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 bands 1 885-1 980 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 MS operating one of or a combination of the following arrangements:

– Frequency division duplex (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 universal terrestrial radio access (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 698-716 MHz, FDD downlink in the band 728-746 MHz, in Annex 1 referred to as FDD Band XII in 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.

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 MS 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	806-901	851-940
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
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 MS operating one of, or a combination of, the following arrangements:

– Time division duplex (TDD) in the band 1 900-1 920 MHz and 2 010-2 025 MHz referred to as Band b) 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.

– TDD in the band 2 570-2 620 MHz referred to as Band d) in UTRA or Band 38 in E-UTRA TDD.

– 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.

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 OoB emission limits defined in Annex 6 are for MS 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
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 – 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.

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 be preferably 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).

Annex 1 – IMT-2000 Code division multiple access (CDMA) direct spread ((UTRA) FDD) mobile stations.

Annex 2 – IMT-2000 CDMA Multi-Carrier (CDMA-2000) mobile stations.

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

Annex 4 – IMT-2000 TDMA Single-Carrier (UWC-136) mobile stations.

Annex 5 – IMT-2000 FDMA/TDMA (digital enhanced cordless telecommunications (DECT)) mobile stations.

Annex 6 – IMT-2000 OFDMA TDD WMAN mobile stations.

Appendix 1 – Definition of test tolerance.

Annex 1

Code division multiple access (CDMA) direct spread ((UTRA) FDD) mobile 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 spectrum emission mask of the MS applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the MS centre carrier frequency. The out-of-channel emission is specified relative to the root raised cosine (RRC) filtered mean power of the user equipment (UE) carrier, where the RRC filtered mean power is the mean power measured through a root raised cosine filter with a roll-off factor of 0.22 and a bandwidth equal to the chip rate of 3.84 MHz. The power of any UE emission should not exceed the levels specified in Table A1-2.1-a.

The absolute requirement is based on a –48.5 dBm/3.84 MHz minimum power threshold for the UE. This limit is expressed for the narrower measurement bandwidths as –54.3 dBm/1 MHz and –69.6 dBm/30 kHz.

TABLE A1-2.1-a

Spectrum emission mask requirement (UTRA FDD MS)

Δf (MHz) (Note 1)	**Minimum requirement (Note 2)**		**Additional requirements Band II, Band IV, Band V and Band X (Note 3)**	**Measurement bandwidth (Note 6)**
	Relative requirement	**Absolute requirement (in measurement bandwidth)**		
2.5-3.5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{\text{MHz}}-2.5\right)\right\}$ dBc	–69.6 dBm	–15 dBm	30 kHz (Note 4)
3.5-7.5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{\text{MHz}}-3.5\right)\right\}$ dBc	–54.3 dBm	–13 dBm (Note 7)	1 MHz (Note 5)
7.5-8.5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{\text{MHz}}-7.5\right)\right\}$ dBc	–54.3 dBm	–13 dBm (Note 7)	1 MHz (Note 5)

TABLE A1-2.1-a (*end*)

Δ*f* (MHz) (Note 1)	Minimum requirement (Note 2)		Additional requirements Band II, Band IV, Band V and Band X (Note 3)	Measurement bandwidth (Note 6)
	Relative requirement	Absolute requirement (in measurement bandwidth)		
8.5-12.5	–47.5 dBc	–54.3 dBm	–13 dBm (Note 7)	1 MHz (Note 5)

NOTE 1 – Δ*f* is the separation between the carrier frequency and the centre of the measurement bandwidth.

NOTE 2 – The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.

NOTE 3 – For operation in Band II, Band IV, Band V and Band X only, the minimum requirement is calculated in Note 2 or the additional requirement for Bands II, IV, V and X, whichever is the lower power.

NOTE 4 – The first and last measurement positions with a 30 kHz filter at Δ*f* equals 2.515 MHz and 3.485 MHz.

NOTE 5 – The first and last measurement positions with a 1 MHz filter at Δ*f* equals 4 MHz and 12 MHz.

NOTE 6 – As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

NOTE 7 – For operation in Band V, the measurement bandwidth of this requirement shall be 100 kHz.

For operation in Bands II, IV, V, X, XII, XIII and XIV the minimum requirement is calculated from the minimum requirement in Table A1-2.1-a or the applicable additional requirement in Tables A1-2.1-b a), A1-2.1-b b) or A1-2.1-b c), whichever is the tighter requirement.

TABLE A1-2.1-b

a) Additional spectrum emission limits for Bands II, IV, X

Δ*f* in MHz (Note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Bands II, IV, X	Measurement bandwidth
2.5 MHz ≤ Δ*f* < 3.5 MHz	2.515 MHz ≤ f_offset < 3.485 MHz	–15 dBm	30 kHz
3.5 MHz ≤ Δ*f* ≤ 12.5 MHz	4.0 MHz ≤ f_offset < 12.0 MHz	–13 dBm	1 MHz

NOTE 1 – Δ*f* is the separation between the carrier frequency and the centre of the measurement bandwidth.

b) Additional spectrum emission limits for Band V

Δ*f* in MHz (Note 1)	Frequency offset of measurement filter centre frequency, f_offset	Additional requirements Band V	Measurement bandwidth
2.5 MHz ≤ Δ*f* < 3.5 MHz	2.515 MHz ≤ f_offset < 3.485 MHz	–15 dBm	30 kHz
3.5 MHz ≤ Δ*f* ≤ 12.5 MHz	3.55 MHz ≤ f_offset < 12.45 MHz	–13 dBm	100 kHz

NOTE 1 – Δ*f* is the separation between the carrier frequency and the centre of the measurement bandwidth.

c) Additional spectrum emission limits for Bands XII, XIII, XIV

Δf in MHz (Note 1)	**Frequency offset of measurement filter centre frequency, f_offset**	**Additional requirements Bands XII, XIII, XIV**	**Measurement bandwidth**
2.5 MHz ≤ Δf < 2.6 MHz	2.515 MHz ≤ f_offset < 2.585 MHz	–13 dBm	30 kHz
2.6 MHz ≤ Δf ≤ 12.45 MHz	2.65 MHz ≤ f_offset < 12.45 MHz	–13 dBm	100 kHz

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.

NOTE – As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth specified in Tables A1-2.1-b a), A1-2.1-b b) and A1-2.1-b c). However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

2.1.1 Additional spectrum emission mask for DC-HSUPA

The spectrum emission mask of the UE applies to frequencies, which are between 5 MHz and 20 MHz away from the UE centre frequency of the two assigned channel frequencies. The requirements assume that the UE output power shall be maximum level.

The power of any UE emission shall not exceed the levels specified in Table A1-2.1.1 for the specified channel bandwidth.

TABLE A1-2.1.1

Spectrum emission mask for DC-HSUPA

Δf (MHz)	**Spectrum emission limit (dBm)**	**Measurement bandwidth**
±5-6	–18	30 kHz
±6-10	–10	1 MHz
±10-19	–13	1 MHz
±19-20	–25	1 MHz

NOTE – Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.

2.1.1.1 Additional requirement for bands II, IV, V and X

The UE shall meet an additional requirement specified in Table A1-2.1.1.1 for Bands II, IV, V and X.

TABLE A1-2.1.1.1

Additional spectrum emission mask for DC-HSUPA in bands II, IV, V and X

Δf (MHz)	Spectrum emission limit (dBm)	Measurement bandwidth
±5-6	–18	30 kHz
±6-19	–13	1 MHz
±19-20	–25	1 MHz

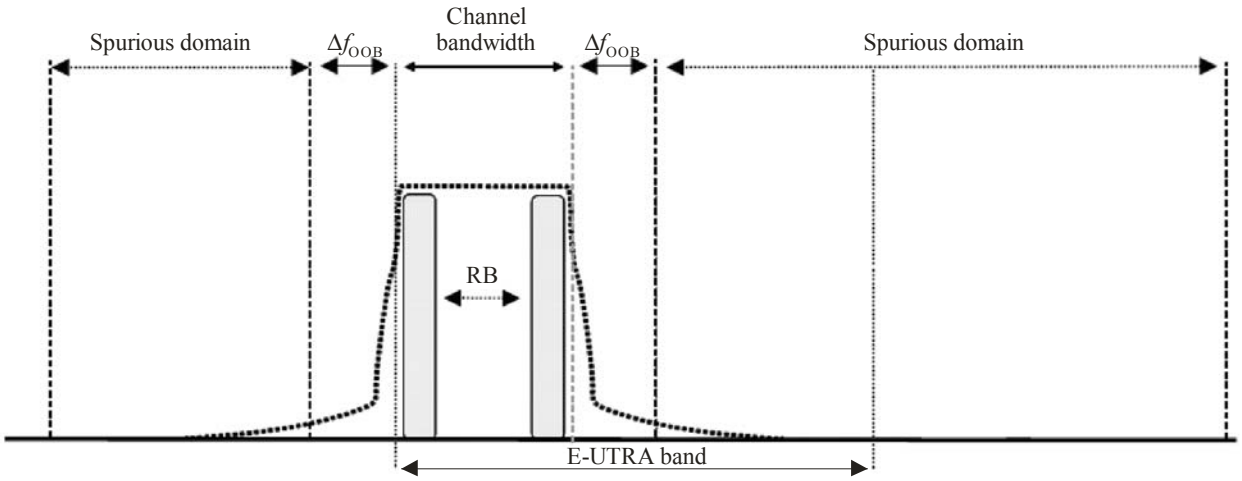
NOTE – Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.

2.2 E-UTRA spectrum mask

The output UE transmitter spectrum consists of the three components; the emission within the occupied bandwidth (channel bandwidth), the OoB emissions and the far-out spurious emission domain (Fig. 1).

The spectrum emission mask of the MS applies to frequencies (Δf_{OOB}) starting from the ± edges of the assigned E-UTRA channel bandwidth. For frequencies greater than (Δf_{OOB}) as specified in Table 1a the spurious requirements in § 4 are applicable.

FIGURE 1



2.2.1 E-UTRA spectrum mask

The power of any MS emission shall not exceed the levels specified in Table A1-2.2.1 for the specified channel bandwidths.

TABLE A1-2.2.1

E-UTRA spectrum emission mask

Δf_{OOB} (MHz)	Spectrum emission limit (dBm)/channel bandwidth						
	1.4 MHz	**3.0 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**	**Measurement bandwidth**
±0-1	–8.5	–11.5	–13.5	–16.5	–18.5	–19.5	30 kHz
±1-2.5	–8.5	–8.5	–8.5	–8.5	–8.5	–8.5	1 MHz
±2.5-2.8	–23.5	–8.5	–8.5	–8.5	–8.5	–8.5	1 MHz
±2.8-5		–8.5	–8.5	–8.5	–8.5	–8.5	1 MHz
±5-6		–23.5	–11.5	–11.5	–11.5	–11.5	1 MHz
±6-10			–23.5	–11.5	–11.5	–11.5	1 MHz
±10-15				–23.5	–11.5	–11.5	1 MHz
±15-20					–23.5	–11.5	1 MHz
±20-25						–23.5	1 MHz

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

2.2.2 Additional E-UTRA spectrum mask

Additional spectrum emission requirements can be signalled by the network to indicate that the UE shall also meet additional requirements in a specific deployment scenario described in Table A1-2.2.2.

TABLE A1-2.2.2

Network signallings for additional spectrum emission requirements

Network signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)
NS_01	N/A (Note 1)	NA	NA
NS_03	§ 2.2.2.1	2, 4, 10, 35, 36	3, 5, 10, 15, 20
NS_04	§ 2.2.2.2	Note 2	Note 3
NS_05	N/A (Note 1)	1	10,15, 20
NS_06	§ 2.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10
NS_07	§ 2.2.2.3	13	10
NS_08	N/A (Note 1)	19	10, 15

TABLE A1-2.2.2 (*end*)

Network signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)
NS_09	N/A (Note 1)	21	10, 15
–	–	–	–
NS_32	–	–	–

NOTE 1 – The signalling is for purposes other than Additional spectrum mask requirement.

NOTE 2 – Applicable E-UTRA band will be addressed at a later stage.

NOTE 3 – Applicable channel bandwidths will be addressed at a later stage.

2.2.2.1 Additional E-UTRA spectrum mask with Network Signalled Value of "NS_03"

When "NS_03" is indicated in the cell, the power of any UE emission shall fulfil requirements in Table A1-2.2.2.1.

TABLE A1-2.2.2.1

Additional requirements (network signalled value "NS_03")

	Spectrum emission limit (dBm)/Channel bandwidth						
Δf_{OOB} (MHz)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Measurement bandwidth
0-1	–8.5	–11.5	–13.5	–16.5	–18.5	–19.5	30 kHz
1-2.5	–11.5	–11.5	–11.5	–11.5	–11.5	–11.5	1 MHz
2.5-5	–23.5						1 MHz
5-6		–23.5					1 MHz
6-10			–23.5				1 MHz
10-15				–23.5			1 MHz
15-20					–23.5		1 MHz
20-25						–23.5	1 MHz

NOTE 1 – The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0.015 MHz and 0.985 MHz.

NOTE 2 – At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0.5 MHz and –0.5 MHz, respectively.

NOTE 3 – The measurements are to be performed above the upper edge of the channel and below the lower edge of the channel.

NOTE 4 – Above SEM requirement applies to bands corresponding to network signalling value NS_03 as defined in Table A1-2.2.2.

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

2.2.2.2 Additional E-UTRA spectrum mask with Network Signalled Value of "NS_04"

When "NS_04" is indicated in the cell, the power of any UE emission shall fulfil requirements in Table A1-2.2.2.2.

TABLE A1-2.2.2.2

Additional requirements (network signalled value "NS_04")

	Spectrum emission limit (dBm)/Channel bandwidth						
Δf_{OOB} (MHz)	**1.4 MHz**	**3.0 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**	**Measurement bandwidth**
0-1	–8.5	–11.5	–13.5	–16.5	–18.5	–19.5	30 kHz
1-2.5		–11.5	–11.5	–11.5	–11.5	–11.5	1 MHz
2.5-5	–23.5						1 MHz
5-6		–23.5	–23.5	–23.5	–23.5	–23.5	1 MHz
6-10							1 MHz
10-15							1 MHz
15-20							1 MHz
20-25							1 MHz

NOTE 1 – The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0.015 MHz and 0.985 MHz.

NOTE 2 – At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0.5 MHz and –0.5 MHz, respectively.

NOTE 3 – The measurements are to be performed above the upper edge of the channel and below the lower edge of the channel.

NOTE 4 – Above SEM requirement applies to bands corresponding to network signalling value NS_04 as defined in Table A1-2.2.2.

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

2.2.2.3 Additional E-UTRA spectrum mask with Network Signalled Value of "NS_06" or "NS 07"

When "NS_06" or "NS_07" is indicated in the cell, the power of any UE emission shall fulfil requirements in Table A1-2.2.2.3.

TABLE A1-2.2.2.3

Additional requirements (network signalled value "NS_06" or "NS_07")

	Spectrum emission limit (dBm)/Channel bandwidth				
Δf_{OOB} (MHz)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	Measurement bandwidth
0-0.1	–11.5	–11.5	–13.5	–16.5	30 kHz
0.1-1	–11.5	–11.5	–11.5	–11.5	100 kHz
1-2.5	–11.5	–11.5	–11.5	–11.5	1 MHz
2.5-5	–23.5				1 MHz
5-6		–23.5			1 MHz
6-10			–23.5		1 MHz
10-15				–23.5	1 MHz

NOTE 1 – The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0.015 MHz and 0.085 MHz. The first and last measurement position with a 100 kHz filter is at Δf_{OOB} equals to 0.15 MHz and 0.95 MHz.

NOTE 2 – At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0.5 MHz and –0.5 MHz, respectively.

NOTE 3 – The measurements are to be performed above the upper edge of the channel and below the lower edge of the channel.

NOTE 4 – Above SEM requirement applies to bands corresponding to network signalling value NS_06 and NS_07 as defined in Table A1-2.2.2.

3 Adjacent channel leakage power ratio (ACLR)

3.1 UTRA ACLR

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

The limit for ACLR should be as specified in Table A1-3.1.

TABLE A1-3.1

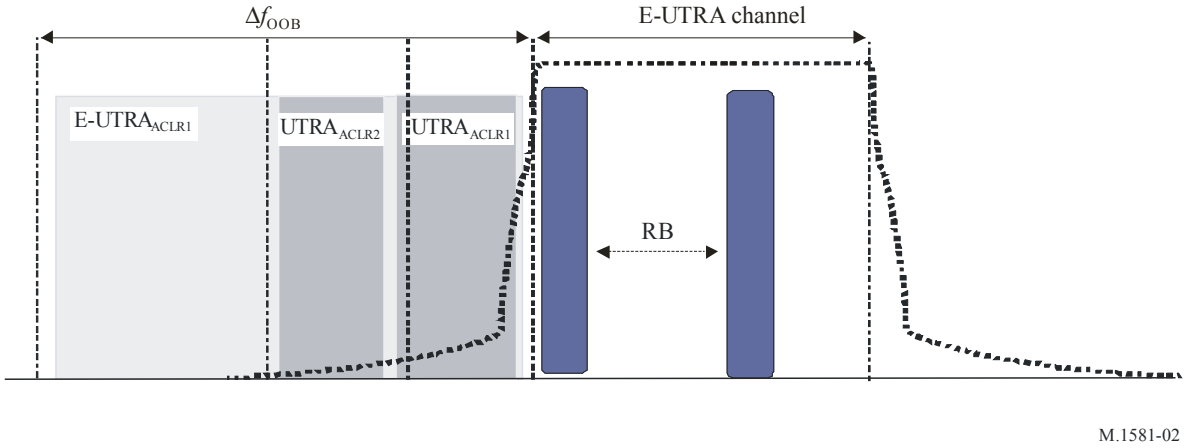
MS ACLR limits

Power class	MS channel offset below the first or above the last carrier frequency used (MHz)	ACLR limit (dB)
3, 4	5	32.2
3, 4	10	42.2

3.2 E-UTRA ACLR

ACLR is the ratio of the filtered mean power centred on the assigned channel frequency to the filtered mean power centred on an adjacent channel frequency. The ACLR requirements are specified for two scenarios: for (an) adjacent E-UTRA and/or UTRA channels (see Fig. 2).

FIGURE 2



3.2.1 Limits for E-UTRA

E-UTRA adjacent channel leakage power ratio (E-UTRAACLR) is the ratio of the filtered mean power centred on the assigned channel frequency to the filtered mean power centred on an adjacent channel frequency. The E-UTRA on channel and adjacent channel power is measured with a rectangular measurement bandwidth filter. If the measured adjacent channel power is greater than –50 dBm then the measured E-UTRAACLR shall be higher than the limits in Table A1-3.2.1.

TABLE A1-3.2.1

General requirements for E-UTRAACLR

	Channel bandwidth/E-UTRAACLR1/measurement bandwidth					
	1.4 MHz	**3.0 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**
E-UTRAACLR1	29.2 dB	29.2 dB	29.2 dB	29.2 dB	29.2 dB	29.2 dB
E-UTRA channel measurement bandwidth	1.08 MHz	2.7 MHz	4.5 MHz	9.0 MHz	13.5 MHz	18 MHz
UE channel	+1.4 MHz or –1.4 MHz	+3 MHz or –3 MHz	+5 MHz or –5 MHz	+10 MHz or –10 MHz	+15 MHz or –15 MHz	+20 MHz or –20 MHz

3.2.2 Limits for E-UTRA for UTRA coexistence in the same geographical area

For adjacent UTRA carriers the limits should be as specified in Table A1-3.2.2.

UTRA adjacent channel leakage power ratio (UTRAACLR) is the ratio of the filtered mean power centred on the assigned E-UTRA channel frequency to the filtered mean power centred on an adjacent(s) UTRA channel frequency.

UTRA adjacent channel leakage power ratio is specified for both the first UTRA 5 MHz adjacent channel (UTRAACLR1) and the 2nd UTRA 5 MHz adjacent channel (UTRAACLR2). The UTRA channel is measured with a 3.84 MHz RRC bandwidth filter with roll-off factor $\alpha = 0.22$. The E-UTRA channel is measured with a rectangular measurement bandwidth filter. If the measured UTRA channel power is greater than –50 dBm then the measured UTRA$_{ACLR1}$, UTRA$_{ACLR2}$ shall be higher than the limits in Table A1-3.2.2.

TABLE A1-3.2.2

Additional requirements

	Channel bandwidth/UTRAACLR1/2/measurement bandwidth					
	1.4 MHz	**3.0 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**
UTRAACLR1	32.2 dB	32.2 dB	32.2 dB	32.2 dB	32.2 dB	32.2 dB
Adjacent channel centre frequency offset (MHz)	0.7+ BWUTRA/2/ –0.7- BWUTRA/2	1.5+ BWUTRA/2/ –1.5- BWUTRA/2	+2.5+BWUTRA/2/ –2.5+BWUTRA/2	5+BWUTRA/2/ –5+ BWUTRA/2	7.5+BWUTRA/2/ –7.5+ BWUTRA/2	10+BWUTRA/ 2/–10+ BWUTRA/2
UTRAACLR2	–	–	35.2 dB	35.2 dB	35.2 dB	35.2 dB
Adjacent channel centre frequency offset (MHz)	–	–	2.5+3*BWUTRA/ 2/–2.5+ 3*BWUTRA/2	5+3*BWUTRA/ 2/–5+ 3*BWUTRA/2	7.5+3*BWUTRA/ 2/–7.5+ 3*BWUTRA/2	10+3* BWUTRA/ 2/–10+ 3*BWUTRA/2
E-UTRA channel measurement bandwidth	1.08 MHz	2.7 MHz	4.5 MHz	9.0 MHz	13.5 MHz	18 MHz
UTRA 5 MHz channel measurement bandwidth[(1)]	3.84 MHz	3.84 MHz	3.84 MHz	3.84 MHz	3.84 MHz	3.84 MHz
UTRA 1.6 MHz channel measurement bandwidth[(2)]	1.28 MHz	1.28 MHz	1.28 MHz	1.28 MHz	1.28 MHz	1.28 MHz

(1) Applicable for E-UTRA FDD coexistence with UTRA FDD in paired spectrum.

(2) Applicable for E-UTRA TDD coexistence with UTRA TDD in unpaired spectrum.

3.2.3 Additional ACLR limits for UTRA

In case of DC-HSUPA operation, if the adjacent channel power is greater than –50 dBm then the ACLR shall be higher than the value specified in Table A1-3.2.3.

TABLE A1-3.2.3

UE ACLR for DC-HSUPA

Power class	**Adjacent channel frequency relative to the centre of two assigned channel frequencies**	**ACLR limit**
3, 4	+7.5 MHz or –7.5 MHz	32.2 dB
3, 4	+12.5 MHz or –12.5 MHz	35.2 dB

NOTE 1 – The requirement shall still be met in the presence of switching transients.

NOTE 2 – The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3 – Requirement on the UE shall be reconsidered when the state of the art technology progresses.

4 Transmitter spurious emissions (conducted)

4.1 Transmitter spurious emissions for UTRA

For UTRA, the limits shown in Tables A1-4.1-a and A1-4.1-b are only applicable for frequencies which are greater than 12.5 MHz away from the MS centre carrier frequency.

TABLE A1-4.1-a

General spurious emissions requirements

Frequency bandwidth	Measurement bandwidth	Minimum requirement (dBm)
9 kHz ≤ f < 150 kHz	1 kHz	–36
150 kHz ≤ f < 30 MHz	10 kHz	–36
30 MHz ≤ f < 1 000 MHz	100 kHz	–36
1 GHz ≤ f < 12.75 GHz	1 MHz	–30

TABLE A1-4.1-b

Additional spurious emissions requirements for UTRA

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
I	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	–60 dBm (see Note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	–67 dBm (see Note 1) –60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	–79 dBm (see Note 1)
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	–71 dBm (see Note 1)
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm
	1 884.5 MHz < f < 1 919.6 MHz	300 kHz	–41 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–60 dBm
II	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm
	746 MHz ≤ f ≤ 758 MHz	3.84 MHz	–60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm

TABLE A1-4.1-b (*continued*)

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
III	921 MHz ≤ f < 925 MHz	100 kHz	–60 dBm (see Note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	–67 dBm (see Note 1) –60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	–79 dBm (see Note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	3.84 MHz	–60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–60 dBm
IV	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
V	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
VI	860 MHz ≤ f < 875 MHz	1 MHz	–37 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm
	1 884.5 MHz ≤ f ≤ 1 919.6 MHz	300 kHz	–41 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
VII	921 MHz ≤ f < 925 MHz	100 kHz	–60 dBm (see Note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	–67 dBm (see Note 1) –60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	–79 dBm (see Note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	–71 dBm (see Note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–60 dBm
	2 590 MHz ≤ f ≤ 2 620 MHz	3.84 MHz	–50 dBm

TABLE A1-4.1-b (*continued*)

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
VIII	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	–67 dBm (see Note 1) –60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3.84 MHz	–79 dBm (see Note 1) –60 dBm
	1 805 MHz < f ≤ 1 830 MHz	100 kHz 3.84 MHz	–71 dBm (see Notes 1 and 2) –60 dBm (see Note 2)
	1 830 MHz < f ≤ 1 880 MHz	100 kHz 3.84 MHz	–71 dBm (see Note 1) –60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
	2 620 MHz ≤ f ≤ 2 640 MHz	3.84 MHz	–60 dBm
	2 640 MHz < f ≤ 2 690 MHz	3.84 MHz	–60 dBm (see Note 2)
IX	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm
	1 884.5 MHz ≤ f ≤ 1 919.6 MHz	300 kHz	–41 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
X	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
XI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm
	1 884.5 MHz ≤ f ≤ 1 919.6 MHz	300 kHz	–41 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
XII	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm

TABLE A1-4.1-b (*end*)

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
XIII	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm
	746 MHz ≤ f ≤ 756MHz	3.84 MHz	–60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm
	763 MHz ≤ f ≤ 775 MHz	6.25 kHz	(see Note 3)
	793 MHz ≤ f ≤ 805 MHz	6.25 kHz	(see Note 3)
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
XIV	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm
	769 MHz ≤ f ≤ 775 MHz	6.25 kHz	(see Note 3)
	799 MHz ≤ f ≤ 805 MHz	6.25 kHz	(see Note 3)
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
XIX	860 MHz ≤ f ≤ 875 MHz	1 MHz	–37 dBm
	875 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm
	1 884.5 MHz ≤f ≤1 919.6 MHz	300 kHz	–41 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm
XXI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	1 MHz	–35 dBm
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm
	1 884.5 MHz ≤ f ≤ 1 919.6 MHz	300 kHz	–41 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm

NOTE 1 – The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 3 are permitted for each channel used in the measurement.

NOTE 2 – The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in Table 3 are permitted for each channel used in the measurement due to second or third harmonic spurious emissions.

NOTE 3 – The Additional spurious emissions requirements for the row will be addressed at a later stage.

4.2 Transmitter spurious emissions for E-UTRA

For E-UTRA, the spurious emission limits apply for frequency ranges that are more than Δf_{OOB} (MHz) from the edge of the channel bandwidth (Table A1-4.2-a).

TABLE A1-4.2-a

Boundary between E-UTRA Δf_{OOB} and spurious emission domain

Channel bandwidth	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Δf_{OOB} (MHz)	2.8	6	10	15	20	25

Additional spectrum emission requirements can be signalled by the network to indicate that the UE shall also meet additional requirements in a specific deployment scenario described in Table A1-4.2-b.

TABLE A1-4.2-b

Network signallings for additional spectrum emission requirements

Network signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)
NS_01	N/A (Note 1)	NA	NA
NS_03	N/A (Note 1)	2, 4, 10, 35, 36	3, 5, 10, 15, 20
NS_04	N/A (Note 1)	Note 2	Note 3
NS_05	§ 4.2.1.1	1	10, 15, 20
NS_06	N/A (Note 1)	12, 13, 14, 17	1.4, 3, 5, 10
NS_07	§ 4.2.1.2	13	10
NS_08	§ 4.2.1.3	19	10, 15
NS_09	§ 4.2.1.4	21	10, 15
..			
NS_32	–	–	–

NOTE 1 – The signalling is for purposes other than additional spectrum emission requirements.

NOTE 2 – Applicable E-UTRA band will be addressed at a later stage.

NOTE 3 – Applicable channel bandwidths will be addressed at a later stage.

The spurious emission limits in Table A1-4.2-c apply for all E-UTRA transmitter band configurations and channel bandwidths.

TABLE A1-4.2-c

Spurious emissions limits

Frequency range	Measurement bandwidth	Maximum level
9 kHz ≤ f < 150 kHz	1 kHz	–36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	–36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	–36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	–30 dBm

Table A1-4.2-d specifies the requirements for the specified E-UTRA band.

TABLE A1-4.2-d

Spurious emissions requirements for UE coexistence in E-UTRA bands

E-UTRA band	Spurious emission						
	Protected band	**Frequency range (MHz)**			**Level (dBm)**	**Bandwidth (MHz)**	**Comment**
1	E-UTRA Bands 1, 3, 7, 8, 9, 11, 20, 21, 34, 38, 40	FDL_low	–	FDL_high	–50	1	
	Frequency range	860	–	895	–50	1	
	Frequency range	1 884.5	–	1 919.6	–41	0.3	Note 6, Note 7
		1 884.5	–	1 915.7			Note 6, Note 8
	E-UTRA Band 33	1 900	–	1 920	–50	1	Note 3
	E-UTRA Band 39	1 880	–	1 920	–50	1	Note 3
2	E-UTRA Bands 2, 4, 5, 10, 13, 14, 17	FDL_low	–	FDL_high	–50	1	
3	E-UTRA Bands 1, 3, 7, 8, 20, 33, 34, 38	FDL_low	–	FDL_high	–50	1	
4	E-UTRA Bands 2, 4, 5, 10, 12, 13, 14, 17	FDL_low	–	FDL_high	–50	1	
5	E-UTRA Bands 2, 4, 5, 10, 12, 13, 14, 17	FDL_low	–	FDL_high	–50	1	
6	E-UTRA Bands 1, 9, 11, 34	FDL_low	–	FDL_high	–50	1	
	Frequency range	860	–	875	–37	1	
	Frequency range	875	–	895	–50	1	
	Frequency range	1 884.5	–	1 919.6	–41	0.3	Note 7
		1 884.5	–	1 915.7			Note 8
7	E-UTRA Bands 1, 3, 7, 8, 20, 33, 34	FDL_low	–	FDL_high	–50	1	
	E-UTRA Band 38	2 570	–	2 620	–50	1	Note 3

TABLE A1-4.2-d (*continued*)

E-UTRA band	Spurious emission						
	Protected band	**Frequency range (MHz)**			**Level (dBm)**	**Bandwidth (MHz)**	**Comment**
8	E-UTRA Bands 1, 8, 7, 20, 33, 34, 38, 39, 40	FDL_low	–	FDL_high	–50	1	
	E-UTRA Band 3	1 805	–	1 830	–50	1	Note 4
	E-UTRA Band 3	1 805	–	1 880	–36	0.1	Notes 2, 4
	E-UTRA Band 3	1 830	–	1 880	–50	1	Note 4
	E-UTRA Band 7	2 640	–	2 690	–50	1	Note 4
	E-UTRA Band 7	2 640	–	2 690	36	0.1	Notes 2, 4
9	E-UTRA Bands 1, 9, 11, 34	FDL_low	–	FDL_high	–50	1	
	Frequency range	860	–	895	–50	1	
	Frequency range	1 884.5	–	1 919.6	–41	0.3	Note 7
		1 884.5	–	1 915.7			Note 8
10	E-UTRA Bands 2, 4, 5, 10, 12, 13, 14, 17	FDL_low	–	FDL_high	–50	1	
11	E-UTRA Bands 1, 9, 11, 21, 34	FDL_low	–	FDL_high	–50	1	
	Frequency range	860	–	895	–50	1	
	Frequency range	1 884.5	–	1 919.6	–41	0.3	Note 7
		1 884.5	–	1 915.7			Note 8
12	E-UTRA Bands 2, 4, 5, 10, 12, 13, 14, 17	FDL_low	–	FDL_high	–50	1	
13	E-UTRA Bands 2, 4, 5, 10, 12, 13, 14, 17	FDL_low	–	FDL_high	–50	1	
	Frequency range	763	–	775	–35	0.00625	
14	E-UTRA Bands 2, 4, 5, 10, 12, 13, 14, 17	FDL_low	–	FDL_high	–50	1	
	Frequency range	763	–	775	–35	0.00625	
17	E-UTRA Bands 2, 4, 5, 10, 12, 13, 14, 17	FDL_low	–	FDL_high	–50	1	
18	E-UTRA Bands 1, 9, 11, 21, 34	FDL_low	–	FDL_high	–50	1	
	Frequency range	860	–	895	–40	1	
	Frequency range	1 884.5	–	1 919.6	–41	0.3	Note 7
		1 884.5	–	1 915.7			Note 8

TABLE A1-4.2-d (*end*)

E-UTRA band	Spurious emission						
	Protected band	**Frequency range (MHz)**			**Level (dBm)**	**Bandwidth (MHz)**	**Comment**
19	E-UTRA Bands 1, 9, 11, 21, 34	FDL_low	–	FDL_high	–50	1	
	Frequency range	860	–	895	–40	1	Note 9
	Frequency range	1 884.5	–	1 919.6	–41	0.3	Note 7
		1 884.5	–	1 915.7			Note 8
20	E-UTRA Bands 1, 3, 7, 8, 33, 34, 38, 39, 40	FDL_low	–	FDL_high	–50	1	
	Frequency range	2 570	–	2 586	–36	0.1	Note 2, Note 4
21	E-UTRA Bands 11, 21	1 475.9	–	1 510.9	–35	1	Note 10
	E-UTRA Bands 1, 9, 34	FDL_low	–	FDL_high	–50	1	
	Frequency range	860	–	895	–50	1	
	Frequency range	1 884.5	–	1 919.6	–41	0.3	Note 7
		1 884.5	–	1 915.7			Note 8

NOTE 1 – FDL_low and FDL_high refer to each E-UTRA frequency band specified in Note 2 of *recommends* 1.

NOTE 2 – As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2nd or 3rd harmonic spurious emissions. An exception is allowed if there is at least one individual RE within the transmission bandwidth (see Fig. 5.4.2-1) for which the 2nd or 3rd harmonic, i.e. the frequency equal to two or three times the frequency of that RE, is within the measurement bandwidth.

NOTE 3 – To meet these requirements some restriction will be needed for either the operating band or protected band.

NOTE 4 – Requirements are specified in terms of E-UTRA sub-bands.

NOTE 5 – For non-synchronized TDD operation to meet these requirements some restriction will be needed for either the operating band or protected band.

NOTE 6 – Applicable when NS_05 is signalled by the network.

NOTE 7 – Applicable when co-existence with PHS system operating in 1 884.5-1 919.6 MHz.

NOTE 8 – Applicable when co-existence with PHS system operating in 1 884.5-1 915.7 MHz.

NOTE 9 – Applicable when NS_08 is signalled by the network.

NOTE 10 – Applicable when NS_09 is signalled by the network.

4.2.1 Additional spurious emissions

These requirements are specified in terms of an additional spectrum emission requirement. Additional spurious emission requirements are signalled by the network to indicate that the UE shall meet an additional requirement for a specific deployment scenario as part of the cell handover/broadcast message.

4.2.1.1 Minimum requirement (network signalled value "NS_05")

When "NS_05" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table A1-4.2.1.1. This requirement also applies for the frequency ranges that are less than Δf_{OOB} (MHz) in Table A1-4.2-a from the edge of the channel bandwidth.

TABLE A1-4.2.1.1

Additional requirements (PHS)

Frequency band (MHz)	Channel bandwidth/Spectrum emission limit (dBm)				Measurement bandwidth
	5 MHz	10 MHz	15 MHz	20 MHz	
$1\,884.5 \le f \le 1\,919.6$[*1]	–41	–41	–41	–41	300 kHz
$1\,884.5 \le f \le 1\,915.7$[*2]	–41	–41	–41	–41	300 kHz

NOTE 1 – Applicable when the lower edge of the assigned E-UTRA UL channel bandwidth frequency is larger than or equal to the upper edge of PHS band (1 919.6 MHz) + 4 MHz + the Channel BW assigned. Operations below this point are for further study.

NOTE 2 – Applicable when the lower edge of the assigned E-UTRA UL channel bandwidth frequency is larger than or equal to the upper edge of PHS band (1 915.7 MHz) + 4 MHz + the Channel BW assigned, where Channel BW. Operations below this point are for further study.

For measurement conditions at the edge of each frequency range, the lowest frequency of the measurement position in each frequency range should be set at the lowest boundary of the frequency range plus MBW/2. The highest frequency of the measurement position in each frequency range should be set at the highest boundary of the frequency range minus MBW/2. MBW denotes the measurement bandwidth (300 kHz).

4.2.1.2 Minimum requirement (network signalled value "NS_07")

When "NS_07" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table A1-4.2.1.2.

TABLE A1-4.2.1.2

Additional requirements

Frequency band (MHz)	Channel bandwidth/Spectrum emission limit (dBm) 10 MHz	Measurement bandwidth
$763 \le f \le 775$	–57	6.25 kHz

4.2.1.3 Minimum requirement (network signalled value "NS_08")

When "NS_08" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table A1-4.2.1.3. This requirement also applies for the frequency ranges that are less than Δf_{OOB} (MHz) in Table A1-4.2.1.3 from the edge of the channel bandwidth.

TABLE A1-4.2.1.3

Additional requirements

Frequency band (MHz)	Channel bandwidth Spectrum emission limit (dBm)			Measurement bandwidth
	5 MHz	10 MHz	15 MHz	
$860 \leq f \leq 895$	–40	–40	–40	1 MHz

For measurement conditions at the edge of each frequency range, the lowest frequency of the measurement position in each frequency range should be set at the lowest boundary of the frequency range plus MBW/2. The highest frequency of the measurement position in each frequency range should be set at the highest boundary of the frequency range minus MBW/2. MBW denotes the measurement bandwidth (1 MHz).

4.2.1.4 Minimum requirement (network signalled value "NS_09")

When "NS_09" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table A1-4.2.1.4. This requirement also applies for the frequency ranges that are less than Δf_{OOB} (MHz) in Table A1-4.2-a from the edge of the channel bandwidth.

TABLE A1-4.2.1.4

Additional requirements

Frequency band (MHz)	Channel bandwidth/Spectrum emission limit (dBm)			Measurement bandwidth
	5 MHz	10 MHz	15 MHz	
$1\,475.9 \leq f \leq 1\,510.9$	–35	–35	–35	1 MHz

For measurement conditions at the edge of each frequency range, the lowest frequency of the measurement position in each frequency range should be set at the lowest boundary of the frequency range plus MBW/2. The highest frequency of the measurement position in each frequency range should be set at the highest boundary of the frequency range minus MBW/2. MBW denotes the measurement bandwidth (1 MHz).

5 Receiver spurious emissions (conducted)

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector.

5.1 Receiver spurious emissions for UTRA

For UTRA, the power of any narrow-band continuous wave (CW) spurious emission should not exceed the maximum level specified in Tables A1-5.1-a and A1-5.1-b.

TABLE A1-5.1-a

General receiver spurious emission requirements

Frequency band	Measurement bandwidth	Maximum level	Note
30 MHz ≤ f < 1 GHz	100 kHz	–57 (dBm)	
1 GHz ≤ f ≤ 12.75 GHz	1 MHz	–47 (dBm)	

For UTRA the following additional spurious emission limits are applicable.

TABLE A1-5.1-b

Additional receiver spurious emission requirements

Band	Frequency band	Measurement bandwidth	Maximum level	Note
I	791 MHz ≤ f ≤ 821 MHz	3.84 MHz	–60 dBm	
	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm	
	921 MHz ≤ f < 925 MHz	100 kHz	–60 dBm(1)	
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	–67 dBm(1) –60 dBm	
	935 MHz ≤ f ≤ 960 MHz	100 kHz	–79 dBm(1)	
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	–71 dBm(1)	
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm	
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm	
	1 920 MHz ≤ f ≤ 1 980 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	UE receive band
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–60 dBm	
II	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm	
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm	
	1 850 MHz ≤ f ≤ 1 910 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm	UE receive band
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	

TABLE A1-5.1-b (*continued*)

Band	Frequency band	Measurement bandwidth	Maximum level	Note
III	921 MHz ≤ f ≤ 925 MHz	100 kHz	–60 dBm(1)	
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	–67 dBm(1) –60 dBm	
	935 MHz ≤ f ≤ 960 MHz	100 kHz	–79 dBm(1)	
	1 710 MHz ≤ f ≤ 1 785 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1 805 MHz ≤ f ≤ 1 880 MHz	3.84 MHz	–60 dBm	UE receive band
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–60 dBm	
IV	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm	
	869 MHz ≤ f < 894 MHz	3.84 MHz	–60 dBm	
	1 710 MHz ≤ f ≤ 1 755 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm	
	2 110 MHz≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	UE receive band
V	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm	
	824 MHz ≤ f ≤ 849 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	869 MHz ≤ f < 894 MHz	3.84 MHz	–60 dBm	UE receive band
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
VI	815 MHz ≤ f ≤ 850 MHz	3.84 MHz	–60 dBm	UE in URA_PCH, Cell_PCH and idle state
	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm	UE in URA_PCH, Cell_PCH and idle state
	1 475.9 MHz ≤ f ≤1 510.9 MHz	3.84 MHz	–60 dBm	
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	

TABLE A1-5.1-b (*continued*)

Band	Frequency band	Measurement bandwidth	Maximum level	Note
VII	921 MHz ≤ f ≤ 925 MHz	100 kHz	–60 dBm[1]	
	925 MHz ≤ f ≤ 935 MHz	100 kHz –3.84 MHz	–67 dBm[1] –60 dBm	
	935 MHz ≤ f ≤ 960 MHz	100 kHz	–79 dBm[1]	
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	–71 dBm[1]	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
	2 500 MHz ≤ f ≤ 2 570 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–60 dBm	UE receive band
VIII	880 MHz ≤ f ≤ 915 MHz	3.84 MHz	–60 dBm	UE in URA_PCH, Cell_PCH and idle state
	921 MHz ≤ f ≤ 925 MHz	100 kHz	–60 dBm[1]	
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3.84 MHz	–67 dBm[1] –60 dBm	
	935 MHz ≤ f ≤ 960 MHz	100 kHz	–79 dBm[1]	
	1 805 MHz ≤ f ≤ 1 880 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–60 dBm	
IX	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm	
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm	
	1 749.9 MHz ≤ f ≤ 1 784.9 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm	UE receive band
	2 10 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
X	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm	
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm	
	1 710 MHz ≤ f ≤ 1 770 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	UE receive band

TABLE A1-5.1-b (*continued*)

Band	Frequency band	Measurement bandwidth	Maximum level	Note
XI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm	
	1 427.9 MHz ≤ f ≤ 1 462.9 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm	UE receive band
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
XII	698 MHz ≤ f ≤ 716 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm	UE receive band
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm	
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm	
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
XIII	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm	UE receive band
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm	
	776 MHz ≤ f ≤ 788 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	869 MHz ≤ f ≤ 894 MHz	3.84 MHz	–60 dBm	
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
XIV	728 MHz ≤ f ≤ 746 MHz	3.84 MHz	–60 dBm	
	746 MHz ≤ f ≤ 756 MHz	3.84 MHz	–60 dBm	
	758 MHz ≤ f ≤ 768 MHz	3.84 MHz	–60 dBm	UE receive band
	788 MHz ≤ f ≤ 798 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	869 MHz ≤ f < 894 MHz	3.84 MHz	–60 dBm	
	1 930 MHz ≤ f ≤ 1 990 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	

TABLE A1-5.1-b (*end*)

Band	Frequency band	Measurement bandwidth	Maximum level	Note
XIX	815 MHz ≤ f ≤ 850 MHz	3.84 MHz	–60 dBm	UE in URA_PCH, Cell_PCH and idle state
	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm	UE in URA_PCH, Cell_PCH and idle state
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm	
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
XXI	860 MHz ≤ f ≤ 895 MHz	3.84 MHz	–60 dBm	
	1 427.9 MHz ≤ f ≤ 1 462.9 MHz	3.84 MHz	–60 dBm	UE transmit band in URA_PCH, Cell_PCH and idle state
	1 475.9 MHz ≤ f ≤ 1 510.9 MHz	3.84 MHz	–60 dBm	UE receive band
	1 844.9 MHz ≤ f ≤ 1 879.9 MHz	3.84 MHz	–60 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	

(1) The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table A1-5.1-a are permitted for each UARFCN used in the measurement.

5.2 Receiver spurious emissions for E-UTRA

The power of any narrowband CW spurious emission shall not exceed the maximum level specified in Table A1-5.2.

TABLE A1-5.2

General receiver spurious emission requirements for E-UTRA

Frequency band	Measurement bandwidth	Maximum level	Note
30 MHz ≤ f < 1 GHz	100 kHz	–57 dBm	
1 GHz ≤ f ≤ 12.75 GHz	1 MHz	–47 dBm	

Annex 2

IMT 2000 CDMA Multi-Carrier (CDMA-2000) mobile stations

Part A

CDMA2000 and CDMA2000 high rate packet data (HRPD)

NOTE 1 – Single carrier HRPD spectrum emission mask or spurious emission limits are only applicable for spreading rate 1.

1 Spectrum mask

The emissions supported by the FDD or TDD MS shall be less than the limits specified below.

1.1 Spreading rate 1

When transmitting with spreading rate 1, the spectrum emissions for Band Classes 0, 2, 5, 7, 9, 10, 11 and 12 shall be less than the limits specified in Table A2-A-1.1-a.

TABLE A2-A-1.1-a

Band Classes 0, 2, 5, 7, 9, 10, 11 and 12 spectrum emission mask for spreading rate 1

For $\|\Delta f\|$ within the range (MHz)	Emission limit
885-1.98	Less stringent of –42 dBc/30 kHz or –54 dBm/1.23 MHz
1.25 to 4.00 (Band Class 10 only)	–13 dBm/30 kHz
1.98-4.00	Less stringent of –54 dBc/30 kHz or –54 dBm/1.23 MHz
2.25-4.00 (Band Class 7 only)	–35 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.

When transmitting with spreading rate 1, the spectrum emissions for Band Classes 1, 4, 6, 8, 13, 14 and 15 shall be less than the limits specified in Table A2-A-1.1-b.

TABLE A2-A-1.1-b

Band Classes 1, 4, 6, 8, 13, 14 and 15 spectrum emission mask for spreading rate 1

For $\|\Delta f\|$ within the range (MHz)	Emission limit
1.25 to 1.98	Less stringent of –42 dBc/30 kHz or –54 dBm/1.23 MHz
1.98 to 4.00	Less stringent of –50 dBc/30 kHz or –54 dBm/1.23 MHz
2.25 to 4.00 (Band Classes 6, 8 and 13 only)	$(13 + 1 \times (\Delta f - 2.25\ \text{MHz}))$ 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.

When transmitting in Band Class 3, the spectrum emissions shall be less than the limits specified in Table A2-A-1.1-c.

TABLE A2-A-1.1-c

Band Class 3 spectrum emission mask for spreading rate 1

Measurement frequency (MHz)	For $\|\Delta f\|$ within the range	Emission limit
> 815 and ≤ 850, > 887 and ≤ 889, > 893 and ≤ 901, > 915 and ≤ 925	≥ 900 kHz and < 1.98 MHz	–42 dBc/30 kHz
	≥ 1.98 MHz	25 µW (–16 dBm)/100 kHz; Pout ≤ 30 dBm –54 dBc/100 kHz; Pout > 30 dBm
> 885 and ≤ 958, except > 887 and ≤ 889, > 893 and ≤ 901, > 915 and ≤ 925	< 1.98 MHz	25 µW (–16 dBm)/30 kHz; Pout ≤ 30 dBm Less stringent of –60 dBc/30 kHz or 2.5 µW (–26 dBm)/30 kHz; Pout > 30 dBm
	≥ 1.98 MHz	25 µW (–16 dBm)/100 kHz; Pout ≤ 30 dBm Less stringent of –60 dBc/100 kHz or 2.5 µW (–26 dBm)/100 kHz; Pout > 30 dBm
≤ 885 and > 958, except 815-850	< 1.98 MHz	25 µW (–16 dBm)/30 kHz; Pout ≤ 30 dBm Less stringent of –60 dBc/30 kHz or 2.5 µW (–26 dBm)/30 kHz; Pout > 30 dBm
	≥ 1.98 MHz	25 µW (–16 dBm)/1 MHz; Pout ≤ 44 dBm More stringent of –60 dBc/1 MHz and 20 mW (13 dBm)/1 MHz; Pout > 44 dBm

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = centre frequency – closer measurement edge frequency, f. The lower and upper limits of the frequency measurement are currently 10 MHz and 3 GHz in Japanese radio measurement documents.

When transmitting in Band Class 11 or 12 with spreading rate 1, the spectrum emissions shall also be less than the requirements in Table A2-A-1.1-d for cdma2000 and Table A2-A-1.1-e for HRPD.

TABLE A2-A-1.1-d

Additional cdma2000 Band Classes 11 and 12 spectrum emission mask for spreading rate 1

For $\|\Delta f\|$ within the range	Emission limit
885 to 1.125	$-47 - 7 \times (\|\Delta f\| - 885)/240$ dBc in 30 kHz
1.125 to 1.98	$-54 - 13 \times (\|\Delta f\| - 1\,125)/855$ dBc in 30 kHz
1.98 to 4.00	$-67 - 15 \times (\|\Delta f\| - 1\,980)/2\,020$ dBc in 30 kHz
4.00 to 10.00	–51 dBm in 100 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 coexistence with incumbent services in Europe and are tighter than ITU Category B requirements.

TABLE A2-A-1.1-e

Additional HRPD Band Classes 11 and 12 spectrum emission mask

For $\|\Delta f\|$ within the range (MHz)	Emission limit Band Class 11 Subclasses 4, 5; Band Class 12 Subclass 1	Emission limit Band Class 11 Subclasses 0, 1, 2, 3; Band Class 12 Subclass 0
885 to 1.12	$-47 - 7 \times (\|\Delta f\| - 885)/235$ dBc in 30 kHz	Not specified
1.12 to 1.98	$-54 - 13 \times (\|\Delta f\| - 1\,120)/860$ dBc in 30 kHz	Not specified
1.98 to 4.00	$-67 - 15 \times (\|\Delta f\| - 1\,980)/2\,020$ dBc in 30 kHz	Not specified

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 coexistence with incumbent services in Europe and are tighter than ITU Category B requirements.

1.2 Multi-carrier HRPD

When transmitting in Band Classes 0, 2, 3, 5, 7, 9, 10, 11 or 12 for a HRPD Rev B capable terminal configured with two reverse link channels with maximum frequency separation, the spectrum emissions with ten or more averages shall be less than the limits specified in Table A2-A-1.2-a.

TABLE A2-A-1.2-a

Band Classes 0, 2, 3, 5, 7, 9, 10, 11 and 12 spectrum emission mask for multi-carrier HRPD

For $\|\Delta f\|$ within the range (MHz)	Emission limit
885 kHz to 1.885	6 dBm/1 MHz
> 1.885	–13 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf is measured as the frequency offset from the centre frequency of each reverse CDMA channel.

Emission limits shall apply between the reverse CDMA channels when maximum reverse link bandwidth $\geq 4 \times 1.23$ MHz.

When transmitting in Band Classes 1, 4, 6 or 8 for a HRPD Rev B capable terminal configured with two reverse link channels with maximum frequency separation, the spectrum emissions with ten or more averages shall be less than the limits specified in Table A2-A-1.2-b.

TABLE A2-A-1.2-b

Band Classes 1, 4, 6 and 8 spectrum emission mask for multi-carrier HRPD

For $\|\Delta f\|$ within the range (MHz)	Emission limit
1.25 to 2.25	6 dBm/1 MHz
> 2.25	–13 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf where Δf is measured as the frequency offset from the centre frequency of each channel.

Emission limits shall apply between the carriers when maximum reverse link bandwidth $\geq 4 \times 1.25$ MHz.

A single exception will be allowed for spurious emission frequencies between the two reverse CDMA channels (for both Tables A2-A-1.2-a and A2-A-1.2-b).

For adjacent reverse CDMA channels, the spectrum emissions with ten or more averages shall be less than the limits specified in Tables A2-A-1.2-c and A2-A-1.2-d.

TABLE A2-A-1.2-c

Adjacent multi-carrier spectrum emission limits for number of adjacent reverse CDMA channels, N = 3

For $\|\Delta f\|$ within the range (MHz)	Emission limit
2.5 to 2.7	–14 dBm/30 kHz
2.7 to 3.5	$(14 + 15 \times (\Delta f - 2.7\ \text{MHz}))$ dB/30 kHz
3.08 (Band Class 6 only)	–33 dBc/3.84 MHz
3.5 to 7.5	$(13 + 1 \times (\Delta f - 3.5\ \text{MHz}))$ dBm/1 MHz
7.5 to 8.5	$(17 + 10 \times (\Delta f - 7.5\ \text{MHz}))$ dBm/1 MHz
8.08 (Band Class 6 only)	–43 dBc/3.84 MHz
8.5 to 12.5	–27 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = centre frequency of the middle reverse CDMA channel – closer measurement edge frequency (f). The requirements at offsets of 3.08 and 8.08 MHz are equivalent to ACLR requirements of 33 and 43 dB from a spreading rate 3 mobile station transmitter into a spreading rate 3 or IMT-DS mobile station receiver offset by 5 and 10 MHz respectively. ITU Category B is intended to apply to only Band Classes 6, 8, 9, 11 and 12.

TABLE A2-A-1.2-d

Adjacent multi-carrier spectrum emission limits for number of adjacent reverse CDMA channels, N≠ 3

For $\|\Delta f\|$ within the range (MHz)	Emission limit
$2.5 + \Delta f$ to $3.5 + \Delta$	–13 dBm/(12.5 kHz × N) kHz
$3.5 + \Delta f$ to $3.125 \times (N+1)$	–13 dBm/1 MHz

NOTE 1 – All frequencies in the measurement bandwidth shall satisfy the restrictions on $|\Delta f|$ where Δf = centre frequency – closer measurement edge frequency, f. ITU Category B is intended to apply to only Band Classes 6, 8, 9, 11 and 12. $\Delta f = (N–3) \times 625$ kHz, where N is the number of carriers ($N \geq 2$). Operation outside North America is for future study.

1.3 Spreading rate 3

When transmitting with spreading rate 3, the spectrum emissions shall be less than the limits specified in Table A2-A-1.3.

TABLE A2-A-1.3

Spectrum emission limits for spreading rate 3

For $\|\Delta f\|$ within the range (MHz)	Emission limit
2.5-2.7	–14 dBm/30 kHz
2.7-3.5	$-(14 + 15 \times (\Delta f - 2.7\ \text{MHz}))$ dBm/30 kHz
3.08 (Band Class 6 only)	–33 dBc/3.84 MHz
3.5-7.5	$-(13 + 1 \times (\Delta f - 3.5\ \text{MHz}))$ dBm/1 MHz
7.5-8.5	$-(17 + 10 \times (\Delta f - 7.5\ \text{MHz}))$ dBm/1 MHz
8.08 (Band Class 6 only)	–43 dBc/3.84 MHz
8.5-12.5	–27 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.

The requirements at offsets of 3.08 and 8.08 MHz are equivalent to ACLR requirements of 33 and 43 dB from a spreading rate 3 mobile station transmitter into a spreading rate 3 or IMT-2000 CDMA Direct Spread MS receiver offset by 5 and 10 MHz respectively. ITU Category B is intended to apply to only Band Classes 5, 6, 8, 9, 11 and 12.

2 Transmitter spurious emissions (conducted)

When transmitting with spreading rate 1 or spreading rate 3, the spurious emissions shall be less than the limits specified in Tables A2-A-2-a and A2-A-2-b.

TABLE A2-A-2-a

Transmitter spurious emission limits for spreading rates 1 and 3, respectively (Category A)

For $\|\Delta f\|$ within the range	Frequency bandwidth	Measurement bandwidth	Emission limit (dBm)
> 4 MHz for spreading rate 1	9 kHz < f < 150 kHz	1 kHz	–13
	150 kHz < f < 30 MHz	10 kHz	–13
> 12.5 MHz for spreading rate 3	30 MHz < f < 1 GHz	100 kHz	–13
	1 GHz < f < 12.75 GHz	1 MHz	–13

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.

TABLE A2-A-2-b

Transmitter spurious emission limits for spreading rates 1 and 3, respectively (Category B)

For $\|\Delta f\|$ within the range	Frequency bandwidth	Measurement bandwidth	Emission limit (dBm)
> 4 MHz for spreading rate 1	9 kHz < f < 150 kHz	1 kHz	–36
	150 kHz < f < 30 MHz	10 kHz	–36
> 12.5 MHz for spreading rate 3	30 MHz < f < 1 GHz	100 kHz	–36
	1 GHz < f < 12.75 GHz	1 MHz	–30

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.

When transmitting with spreading rate 1 or spreading rate 3 in Band Class 6, the spurious emissions shall be less than the limits specified in Table A2-A-2-c.

TABLE A2-A-2-c

Additional Band Class 6 transmitter spurious emission limits for spreading rates 1 and 3, respectively

Measurement frequency (MHz)	Measurement bandwidth (kHz)	Emission limit (dBm)	Victim band
1 884.5-1 919.6	300	–41	PHS
925-935	100	–67	GSM 900
935-960	100	–79	GSM 900
1 805-1 880	100	–71	DCS 1800

NOTE 1 – Measurements apply only when the measurement frequency is at least 11.25 MHz (spreading rate 1) or 12.5 MHz (spreading rate 3) from the CDMA centre frequency. The non-PHS system band measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the spurious emission limits in Table A2-A-2-b are allowed.

When transmitting in Band Class 7, the transmitter spurious emissions with ten or more averages shall also be less than the requirements in Table A2-A-2-d.

TABLE A2-A-2-d

Additional Band Class 7 transmitter spurious emission limits

Transmission frequency (MHz)	Measurement frequency (MHz)	Emission limit	Victim band
776-788	763-775	–35 dBm/6.25 kHz	Public safety
788-793	769-775	–35 dBm/6.25 kHz	Public safety
776-788	793-805	–35 dBm/6.25 kHz	Public safety
788-793	799-805	–35 dBm/6.25 kHz	Public safety

When transmitting in Band Classes 11 and 12, the transmitter spurious emissions with ten or more averages shall also be less than the requirements in Table A2-A-2-e.

TABLE A2-A-2-e

Additional Band Classes 11 and 12 transmitter spurious emission limits

For $\|\Delta f\|$ within the range	Emission limit Band Class 11 Subclasses 4, 5; Band Class 12 Subclass 1	Emission limit Band Class 11 Subclasses 0, 1, 2, 3; Band Class 12 Subclass 0
4.00 MHz to 10.0 MHz	–51 dBm in 100 kHz	Not specified

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 coexistence with incumbent services in Europe and are tighter than ITU Category B requirements.

3 Adjacent channel leakage power ratio

For cdma2000 ACLR calculation, both the transmitted power and received power are measured with a rectangular filter. For 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) 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 A2-A-4-a (assuming 23 dBm as transmit power).

4 Receiver spurious emissions (conducted)

The conducted spurious emissions when not transmitting for a MS shall be less than the limits in Table A2-A-4-b.

TABLE A2-A-4-a

Mobile station ACLR limits

Band Class	ACLR1 (dB)	ACLR2 (dB)
0	26.34	37.87
1	32.38	35.37
2	26.34	37.87
3	26.09	28.10
4	32.38	35.37
5	26.34	37.87
6	33.13	37.89
7	26.34	35.29

TABLE A2-A-4-a (*end*)

Band Class	ACLR1 (dB)	ACLR2 (dB)
8	33.13	37.89
9	26.34	37.87
10	20.96	19.87
11	26.34 (HRPD) 39.31 (cdma2000 1x) 39.41 (HRPD: band subclasses 4 and 5 only)	37.87 (HRPD) 55.67 (cdma2000 1x; HRPD: band subclasses 4 and 5 only)
12	26.34 (HRPD) 39.31 (cdma20001x) 39.41 (HRPD: band subclass 1)	37.87 (HRPD) 55.67 (cdma2000 1x; HRPD: band subclass 1 only)
13	33.13	37.89
14	32.38	35.37
15	32.38	35.37

For the 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 cellular band in 800 or 450 MHz, the first adjacent channel offset is 1.5 MHz (1.515 MHz for Band Class 3) (ACLR1) and the second adjacent channel offset is 2.73 MHz (2.745 MHz for Band Class 3) (ACLR2).

TABLE A2-A-4-b

General receiver spurious emission requirements

Frequency band	Measurement bandwidth	Maximum level (dBm)	Note
30 MHz ≤ f < 1 GHz	100 kHz	–57	Band Class 6 only.
1 GHz ≤ f ≤ 12.75 GHz	30 kHz	–54	With the exception of the frequencies covered by Table 21, for which additional receiver spurious emission requirements apply. Band Class 3 only.
1 GHz ≤ f ≤ 12.75 GHz	1 MHz	–47	With the exception of the frequencies covered by Table 19, for which additional receiver spurious emission requirements apply.
1 GHz ≤ f ≤ 12.75 GHz	30 kHz	–47	With the exception of the frequencies covered by Table 21, for which additional receiver spurious emission requirements apply. All Band Classes except 3 and 6.

For all frequencies within the mobile station receive and transmit bands, the conducted emissions shall be below the limits in Table A2-A-4-c.

TABLE A2-A-4-c

Additional receiver spurious emission requirements

Measurement bandwidth (MHz)	Maximum level (dBm)	Note
1	–61	Mobile transmit band
1	–76	Mobile receive band All Band Classes except Band Class 3
1	–81	Mobile receive band Band Class 3

Part B

Ultra mobile broadband (UMB)

1 Spectrum mask

TABLE A2-B-1-a

General spectral emission mask for different bandwidths

Offset from channel edge (MHz)	5 MHz Emissions in dBm/ measurement BW	10 MHz Emissions in dBm/ measurement BW	20 MHz Emissions in dBm/ measurement BW	Measurement BW
±0-1	–15	–18	–21	30 kHz
±1-5	–10	–10	–10	1 MHz
±5-6	–13	–13	–13	1 MHz
±6-10	–25	–13	–13	1 MHz
±10-15		–25	–13	1 MHz
±15-20			–13	1 MHz
±20-25			–25	1 MHz

TABLE A2-B-1-b

Additional spectral emission mask (A-SEM1) for different bandwidths

Offset from channel edge (MHz)	5 MHz Emissions in dBm/ measurement BW	10 MHz Emissions in dBm/ measurement BW	20 MHz Emissions in dBm/ measurement BW	Measurement BW
±0-1	–15	–18	–21	30 kHz
±1-5	–13	–13	–13	1 MHz
±5-6	–13	–13	–13	1 MHz
±6-10	–13	–13	–13	1 MHz
±10-15		–13	–13	1 MHz
±15-20			–13	1 MHz
±20-25			–13	1 MHz

TABLE A2-B-1-c

Additional spectral emission mask (A-SEM2) for different bandwidths

Offset from channel edge (MHz)	5 MHz Emissions in dBm/ measurement BW	10 MHz Emissions in dBm/ measurement BW	20 MHz Emissions in dBm/ measurement BW	Measurement BW
±0-1	–15	–18	–21	30 kHz
±1-5.5	–15	–13	–13	1 MHz
±5.5-10	–25	–25	–25	1 MHz
±10-15		–25	–25	1 MHz
±15-25			–25	1 MHz

TABLE A2-B-1-d

Δ_{SEM} as a function of the channel BW

Channel bandwidth (MHz)	5	10	20
Δ_{SEM} (MHz)	10	15	25

2 Transmitter spurious emission

TABLE A2-B-2-a

Spurious requirements – ITU Category A

Frequency range	Maximum Level	Measurement BW
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 < 10 GHz	–13 dBm	1 MHz

TABLE A2-B-2-b

Spurious requirements – ITU Category B

Frequency range	Maximum Level	Measurement BW
9 kHz ≤ f < 150 kHz	–36 dBm	1 kHz
150 kHz ≤ f < 30 MHz	–36 dBm	10 kHz
30 MHz ≤ f < 1 GHz	–36 dBm	100 kHz
1 GHz ≤ f < 10 GHz	–30 dBm	1 MHz

TABLE A2-B-2-c

PHS coexistence emission requirements

Frequency range	Maximum Level	Measurement BW
1884.5 MHz ≤ f < 1919.6 MHz	–41 dBm	300 kHz

3 Adjacent channel leakage power ratio

TABLE A2-B-3

ACLR specifications

Channel bandwidth (MHz)	5 MHz	10 MHz	20 MHz
ACLR1 (dB)	30	30	30
ACLR2 (dB)	36	36	36
Signal and adjacent channel measurement BW (MHz)	4.61	9.22	18.44

Current region-specific radio regulation rules shall also apply.

Annex 3

CDMA TDD (UTRA TDD) mobile 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 Spectrum mask (3.84 Mchip/s UTRA TDD option)

The spectrum emission mask of the MS applies to frequency offsets (Δf) between 2.5 and 12.5 MHz on both sides of the carrier frequency.

The out-of-channel emission is specified as a power level relative to the MS output power in a frequency band of 3.84 MHz bandwidth.

The power of any MS emission should not exceed –48.5 dBm/3.84 MHz or the levels specified in Table A3-2.1, whichever is higher.

TABLE A3-2.1

Spectrum emission mask requirement (3.84 Mchip/s TDD option)

Δf [(1)] (MHz)	Minimum requirement	Measurement bandwidth
2.5-3.5	–33.5 – 15(1) (Δf/MHz – 2.5) dBc	30 kHz[(2)]
3.5-7.5	–33.5 – 1(1) (Δf/MHz – 3.5) dBc	1 MHz[(3)]
7.5-8.5	–37.5 – 10(1) (Δf/MHz – 7.5) dBc	1 MHz[(3)]
8.5-12.5	–47.5 dBc	1 MHz[(3)]

(1) Δf is the separation between the carrier frequency and the centre of the measuring filter.

(2) The first and last measurement positions with a 30 kHz filter at Δf equals 2.515 MHz and 3.485 MHz.

(3) The first and last measurement positions with a 1 MHz filter at Δf equals 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 1 – The lower limit should be –48.5 dBm/3.84 MHz or the minimum requirement presented in this Table, whichever is the higher.

2.2 Spectrum mask (1.28 Mchip/s UTRA TDD option)

The spectrum emission mask of the MS applies to frequency offsets between 0.8 and 4.0 MHz on both sides of the carrier frequency.

The out-of-channel emission is specified as a power level relative to the MS output power in a frequency band of 1.6 MHz bandwidth.

TABLE A3-2.2

Spectrum emission mask requirement (1.28 Mchip/s TDD option)

Δf [(1)] (MHz)	Minimum requirement	Measurement bandwidth
0.8	–33.5 dBc[(3)]	30 kHz[(2)]
0.8-1.8	–33.5 – 14(1)(Δf/MHz – 0.8) dBc[(3)]	30 kHz[(2)]
1.8-2.4	–47.5 – 17(1)(Δf/MHz – 1.8) dBc[(3)]	30 kHz[(2)]
2.4-4.0	–42.5 dBc[(3)]	1 MHz[(3)]

(1) Δf is the separation between the carrier frequency and the centre of the measuring filter.

(2) The first and last measurement positions with a 30 kHz filter at Δf equals to 0.815 MHz and 2.385 MHz.

(3) The first and last measurement positions with a 1 MHz filter at Δf equals 2.9 MHz and 3.5 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 1 – The lower limit should be –53.5 dBm/1.28 MHz or the minimum requirement presented in this Table, whichever is the higher.

2.3 Spectrum mask (7.68 Mchip/s UTRA TDD option)

The spectrum emission mask of the UE applies to frequencies which are between 5 MHz and 25 MHz from the UE centre carrier frequency. The outofchannel emission is specified relative to the RRC filtered mean power of the UE carrier.

The power of any UE emission should not exceed the levels specified in Table A3-2.3.

TABLE A3-2.3

Spectrum emission mask requirement (7.68 Mchip/s TDD option)

Δf [(1)] (MHz)	Minimum requirement	Measurement bandwidth
5.0-5.75	$\left\{-36.5-10.67\left(\frac{\Delta f}{\text{MHz}}-5.0\right)\right\}$ dBc	30 kHz[(2)]
5.75-7.0	$\left\{-44.5-5.6\left(\frac{\Delta f}{\text{MHz}}-5.75\right)\right\}$ dBc	30 kHz[(2)]
7.0-15.0	$\left\{-36.5-0.5\left(\frac{\Delta f}{\text{MHz}}-7.0\right)\right\}$ dBc	1 MHz[(3)]

TABLE A3-2.3 (*end*)

Δf [(1)] (MHz)	Minimum requirement	Measurement bandwidth
15.0-17.0	$\left\{-40.5-5.0\left(\frac{\Delta f}{\text{MHz}}-15.0\right)\right\}$ dBc	1 MHz[(3)]
17.0-25.0	–51.5 dBc	1 MHz[(3)]

(1) Δf is the separation between the carrier frequency and the centre of the measuring filter.

(2) The first and last measurement positions with a 30 kHz filter at Δf equals 5.015 MHz and 6.985 MHz.

(3) The first and last measurement positions with a 1 MHz filter at Δf equals 7.5 MHz and 24.5 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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.

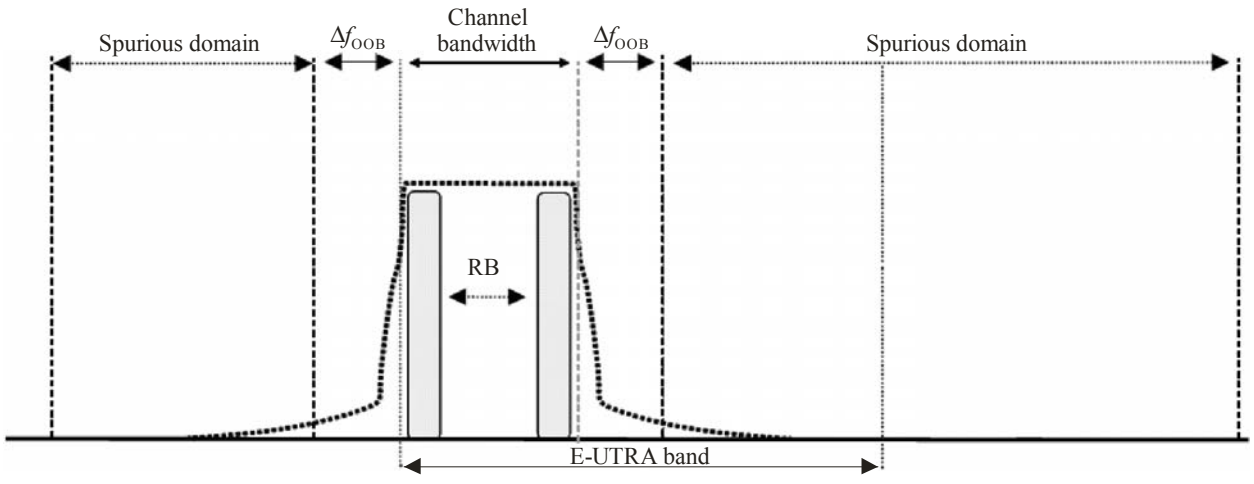
NOTE 1 – The lower limit should be –47 dBm/7.68 MHz or the minimum requirement presented in this Table, whichever is the higher.

2.4 E-UTRA spectrum mask

The output UE transmitter spectrum consists of the three components; the emission within the occupied bandwidth (channel bandwidth), the OoB emissions and the far out spurious emission domain (see Fig. 3).

The spectrum emission mask of the MS applies to frequencies (Δf_{OOB}) starting from the ± edges of the assigned E-UTRA channel bandwidth. For frequencies greater than (Δf_{OOB}) as specified in Table A3-2.4.1 the spurious requirements in § 4 are applicable.

FIGURE 3



2.4.1 General E-UTRA spectrum mask

The power of any MS emission shall not exceed the levels specified in Table A3-2.4.1 for the specified channel bandwidths.

TABLE A3-2.4.1

General E-UTRA spectrum emission mask

Δf_{OOB} (MHz)	Spectrum emission limit (dBm)/Channel bandwidth						
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Measurement bandwidth
±0-1	–8.5	–11.5	–13.5	–16.5	–18.5	–19.5	30 kHz
±1-2.5	–8.5	–8.5	–8.5	–8.5	–8.5	–8.5	1 MHz
±2.5-2.8	–23.5	–8.5	–8.5	–8.5	–8.5	–8.5	1 MHz
±2.8-5		–8.5	–8.5	–8.5	–8.5	–8.5	1 MHz
±5-6		–23.5	–11.5	–11.5	–11.5	–11.5	1 MHz
±6-10			–23.5	–11.5	–11.5	–11.5	1 MHz
±10-15				–23.5	–11.5	–11.5	1 MHz
±15-20					–23.5	–11.5	1 MHz
±20-25						–23.5	1 MHz

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

2.4.2 Additional E-UTRA spectrum mask

Additional spectrum emission requirements can be signalled by the network to indicate that the UE shall also meet additional requirements in a specific deployment scenario described in Table A3-2.4.2.

TABLE A3-2.4.2

Network signallings for additional spectrum emission requirements

Network signalling value	Requirements (subclause)	EUTRA Band	Channel bandwidth (MHz)
NS_01	N/A (Note 1)	N/A	N/A
NS_03	§ 2.4.2.1	2, 4, 10, 35, 36	3, 5, 10, 15, 20
NS_04	§ 2.4.2.2	Note 2	Note 3
NS_05	N/A (Note 1)	1	10, 15, 20
NS_06	§ 2.4.2.3	12, 13, 14, 17	1.4, 3, 5, 10
NS_07	§ 2.4.2.3	13	10
NS_08	N/A (Note 1)	19	10, 15
NS_09	N/A (Note 1)	21	10, 15
NS_32	–	–	–

TABLE A3-2.4.2 (*end*)

NOTE 1 – The signalling is for purposes other than additional spectrum mask requirement.

NOTE 2 – Applicable E-UTRA band will be addressed at a later stage.

NOTE 3 – Applicable channel bandwidths will be addressed at a later stage.

2.4.2.1 Additional E-UTRA spectrum mask with network signalled value of "NS_03"

When "NS_03" is indicated in the cell, the power of any UE emission shall fulfil requirements in Table A3-2.4.2.1.

TABLE A3-2.4.2.1

Additional requirements (network signalled value "NS_03")

	Spectrum emission limit (dBm)/Channel bandwidth						
Δf_{OOB} (MHz)	**1.4 MHz**	**3.0 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**	**Measurement bandwidth**
0-1	–8.5	–11.5	–13.5	–16.5	–18.5	–19.5	30 kHz
1-2.5	–11.5	–11.5	–11.5	–11.5	–11.5	–11.5	1 MHz
2.5-5	–23.5						1 MHz
5-6		–23.5					1 MHz
6-10			–23.5				1 MHz
10-15				–23.5			1 MHz
15-20					–23.5		1 MHz
20-25						–23.5	1 MHz

NOTE 1 – The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0.015 MHz and 0.985 MHz.

NOTE 2 – At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0.5 MHz and –0.5 MHz, respectively.

NOTE 3 – The measurements are to be performed above the upper edge of the channel and below the lower edge of the channel.

NOTE 4 – Above SEM requirement applies to bands corresponding to network signalling value NS_03 as defined in Table A3-2.4.1.

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

2.4.2.2 Additional E-UTRA spectrum mask with Network Signalled Value of "NS_04"

When "NS_04" is indicated in the cell, the power of any UE emission shall fulfil requirements in Table A3-2.4.2.2.

TABLE A3-2.4.2.2

Additional requirements (network signalled value "NS_04")

	Spectrum emission limit (dBm)/Channel bandwidth						
Δf_{OOB} (MHz)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Measurement bandwidth
0-1	–8.5	–11.5	–13.5	–16.5	–18.5	–19.5	30 kHz
1-2.5		–11.5	–11.5	–11.5	–11.5	–11.5	1 MHz
2.5-5	–23.5						1 MHz
5-6		–23.5	–23.5	–23.5	–23.5	–23.5	1 MHz
6-10							1 MHz
10-15							1 MHz
15-20							1 MHz
20-25							1 MHz

NOTE 1 – The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0.015 MHz and 0.985 MHz.

NOTE 2 – At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0.5 MHz and –0.5 MHz, respectively.

NOTE 3 – The measurements are to be performed above the upper edge of the channel and below the lower edge of the channel.

NOTE 4 – Above SEM requirement applies to bands corresponding to network signalling value NS_04 as defined in Table A3-2.4.2.

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

2.4.2.3 Additional EUTRA spectrum mask with network signalled value of "NS_06" or "NS_07"

When "NS_06" or "NS_07" is indicated in the cell, the power of any UE emission shall fulfil requirements in Table A3-2.4.2.3.

TABLE A3-2.4.2.3

Additional requirements (network signalled value "NS_06" or "NS_07")

	Spectrum emission limit (dBm)/Channel bandwidth				
Δf_{OOB} (MHz)	**1.4 MHz**	**3.0 MHz**	**5 MHz**	**10 MHz**	**Measurement bandwidth**
0-0.1	–11.5	–11.5	–13.5	–16.5	30 kHz
0.1-1	–11.5	–11.5	–11.5	–11.5	100 kHz
1-2.5	–11.5	–11.5	–11.5	–11.5	1 MHz
2.5-5	–23.5				1 MHz
5-6		–23.5			1 MHz
6-10			–23.5		1 MHz
10-15				–23.5	1 MHz

NOTE 1 – The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0.015 MHz and 0.085 MHz.

The first and last measurement position with a 100 kHz filter is at Δf_{OOB} equals to 0.15 MHz and 0.95 MHz.

NOTE 2 – At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0.5 MHz and –0.5 MHz, respectively.

NOTE 3 – The measurements are to be performed above the upper edge of the channel and below the lower edge of the channel.

NOTE 4 – Above SEM requirement applies to bands corresponding to network signalling value NS_06 and NS_07 as defined in Table A3-2.4.2.

3 ACLR

3.1 ACLR for UTRA

ACLR is the ratio of the transmitted power to the power measured after a receiver filter in the adjacent channel(s). Both the transmitted power and the received power are measured through a matched filter (root raised cosine and rolloff 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 multicarrier). It applies for all transmission modes foreseen by the manufacturer's specification. The limit for ACLR should be as specified in Tables A3-3.1a) to A3-3.1c).

TABLE A3-3.1

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

Power class	Adjacent channel	ACLR limit (dB)
2, 3	MS channel ± 5 MHz	32.2
2, 3	MS channel ± 10 MHz	42.2

TABLE A3-3.1 (*end*)

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

Power class	Adjacent channel	ACLR limit (dB)
2, 3	MS channel ± 1.6 MHz	32.2
2, 3	MS channel ± 3.2 MHz	42.2

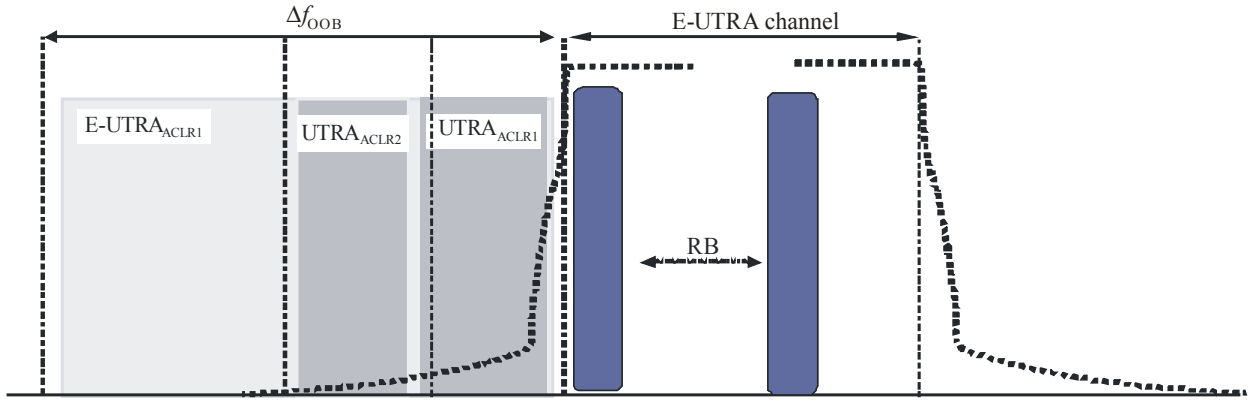
c) MS ACLR limits for 7.68 Mchip/s TDD option

Power class	Adjacent channel	Chip rate for RRC measurement filter (MHz)	ACLR limit (dB)
2, 3	MS channel ± 7.5 MHz	3.84	32.2
2, 3	MS channel ± 12.5 MHz	3.84	42.2
2, 3	MS channel ± 10.0 MHz	7.68	32.2
2, 3	MS channel ± 20.0 MHz	7.68	42.2

3.2 ACLR for E-UTRA

ACLR is the ratio of the filtered mean power centred on the assigned channel frequency to the filtered mean power centred on an adjacent channel frequency. The ACLR requirements are specified for two scenarios: for (an) adjacent E-UTRA and/or UTRA channels (see Fig. 4).

FIGURE 4



3.2.1 Limits for E-UTRA

E-UTRA adjacent channel leakage power ratio (E-UTRAACLR) is the ratio of the filtered mean power centred on the assigned channel frequency to the filtered mean power centred on an adjacent channel frequency. The E-UTRA on channel and adjacent channel power is measured with a rectangular measurement bandwidth filter. If the measured adjacent channel power is greater than –50 dBm then the measured E-UTRAACLR shall be higher than the limits in Table A3-3.2.1.

TABLE A3-3.2.1

General requirements for E-UTRAACLR

	Channel bandwidth/E-UTRAACLR1/measurement bandwidth					
	1.4 MHz	**3 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**
E-UTRAACLR1	–29.2 dB	–29.2 dB	–29.2 dB	–29.2 dB	–29.2 dB	–29.2 dB
E-UTRA channel measurement bandwidth	1.08 MHz	2.7 MHz	4.5 MHz	9.0 MHz	13.5 MHz	18 MHz
UE channel	+1.4 MHz or –1.4 MHz	+3 MHz or –3 MHz	+5 MHz or –5 MHz	+10 MHz or –10 MHz	+15 MHz or –15 MHz	+20 MHz or –20 MHz

3.2.2 Limits for EUTRA for UTRA coexistence in the same geographical area

For adjacent UTRA carriers the limits should be as specified in Table A3-3.2.2.

UTRA adjacent channel leakage power ratio (UTRAACLR) is the ratio of the filtered mean power centred on the assigned EUTRA channel frequency to the filtered mean power centred on an adjacent(s) UTRA channel frequency.

UTRA adjacent channel leakage power ratio is specified for both the first UTRA 5 MHz adjacent channel (UTRAACLR1) and the 2nd UTRA 5 MHz adjacent channel (UTRAACLR2). The UTRA channel is measured with a 3.84 MHz RRC bandwidth filter with rolloff factor $\alpha = 0.22$. The E-TRA channel is measured with a rectangular measurement bandwidth filter. If the measured UTRA channel power is greater than –50 dBm then the measured $UTRA_{ACLR1}$, $UTRA_{ACLR2}$ shall be higher than the limits in Table A3-3.2.2.

TABLE A3-3.2.2

Additional requirements

	Channel bandwidth/UTRAACLR1/2/measurement bandwidth					
	1.4 MHz	**3.0 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**
UTRAACLR1	32.2 dB	32.2 dB	32.2 dB	32.2 dB	32.2 dB	32.2 dB
Adjacent channel centre frequency offset (MHz)	0.7+ BWUTRA/2/ –0.7– BWUTRA/2	1.5+ BWUTRA/2/ –1.5– BWUTRA/2	2.5+ BWUTRA/2	5+BWUTRA/2	7.5+BWUTRA/2	10+BWUTRA/2
UTRAACLR2	–	–	35.2 dB	35.2 dB	35.2 dB	35.2 dB
Adjacent channel centre frequency offset (MHz)	–	–	2.5+3* BWUTRA/2	5+3* BWUTRA/2	7.5+3* BWUTRA/2	10+3* BWUTRA/2
E-UTRA channel measurement bandwidth	1.08 MHz	2.7 MHz	4.5 MHz	9.0 MHz	13.5 MHz	18 MHz
UTRA 5 MHz channel measurement bandwidth(1)	3.84 MHz	3.84 MHz	3.84 MHz	3.84 MHz	3.84 MHz	3.84 MHz

TABLE A3-3.2.2 (*end*)

	Channel bandwidth/UTRAACLR1/2/measurement bandwidth					
	1.4 MHz	**3.0 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**
UTRA 1.6 MHz channel measurement bandwidth[2]	1.28 MHz	1.28 MHz	1.28 MHz	1.28 MHz	1.28 MHz	1.28 MHz

(1) Applicable for EUTRA FDD coexistence with UTRA FDD in paired spectrum.

(2) Applicable for EUTRA TDD coexistence with UTRA TDD in unpaired spectrum.

4 Transmitter spurious emissions (conducted)

4.1 Transmitter spurious emissions for UTRA

For UTRA, the spurious emissions should be less than the limits specified in Tables A3-4.1-a and A3-4.1-b a) to A3-4.1-b c). The following requirements are only applicable for MS centre carrier frequency offsets greater than 12.5 MHz (3.84 Mchip/s TDD option), 4 MHz (1.28 Mchip/s TDD option) or 25 MHz (7.68 Mchip/s TDD option).

TABLE A3-4.1-a

General spurious emissions requirements for UTRA

Frequency band	Measurement bandwidth	Minimum requirement (dBm)
9 kHz ≤ f < 150 kHz	1 kHz	–36
150 kHz ≤ f < 30 MHz	10 kHz	–36
30 MHz ≤ f < 1 000 MHz	100 kHz	–36
1 GHz ≤ f < 12.75 GHz	1 MHz	–30

TABLE A3-4.1-b

a) Additional spurious emissions requirements (3.84 Mchip/s TDD option)

Frequency bandwidth	Measurement bandwidth	Minimum requirement (dBm)
921 MHz ≤ f < 925 MHz	100 kHz	–60 (Note 1)
925 MHz ≤ f ≤ 935 MHz	100 kHz	–67 (Note 1)
935 MHz < f ≤ 960 MHz	100 kHz	–79 (Note 1)
1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	–71 (Note 1)
1 884.5 MHz ≤ f ≤ 1 919.6 MHz	300 kHz	–41 (Note 2)
2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–37 (Note 1)

NOTE 1 – The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table A3-4.1-a are permitted for each UARFCN used in the measurement.

NOTE 2 – Applicable for transmission in 2 010-2 025 MHz.

TABLE A3-4.1-b (*continued*)

b) Additional spurious emissions requirements (1.28 Mchip/s TDD option)

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
a	921 MHz ≤ f < 925 MHz	100 kHz	–60 dBm (Note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	–67 dBm (Note 1)
	935 MHz < f ≤ 960 MHz	100 kHz	–79 dBm (Note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	–71 dBm (Note 1)
	2 010 MHz ≤ f ≤ 2 025 MHz	1 MHz	–65 dBm (Note 2)
	1 900 MHz ≤ f ≤ 1 920 MHz	1 MHz	–65 dBm (Note 3)
b	1 850 MHz ≤ f ≤ 1 910 MHz	1 MHz	–65 dBm (Note 4)
	1 930 MHz ≤ f ≤ 1 990 MHz	1 MHz	–65 dBm (Note 5)
	2 010 MHz ≤ f ≤ 2 025 MHz	1 MHz	–65 dBm
c	2 010 MHz ≤ f ≤ 2 025 MHz	1 MHz	–65 dBm
d	1 900 MHz ≤ f ≤ 1 920 MHz	1 MHz	–65 dBm
	2 010 MHz ≤ f ≤ 2 025 MHz	1 MHz	–65 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–37 dBm
e	921 MHz ≤ f < 925 MHz	100 kHz	–60 dBm (Note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	–67 dBm (Note 1)
	935 MHz < f ≤ 960 MHz	100 kHz	–79 dBm (Note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	–71 dBm (Note 1)
	1 900 MHz ≤ f ≤ 1 920 MHz	1 MHz	–65 dBm
	2 010 MHz ≤ f ≤ 2 025 MHz	1 MHz	–65 dBm
f	921 MHz ≤ f < 925 MHz	100 kHz	–60 dBm (Note 1)
	925 MHz < f < 935 MHz	100 kHz	–67 dBm (Note 1)
	935 MHz < f < 960 MHz	100 kHz	–79 dBm (Note 1)
	1 805 MHz ≤ f ≤ 1 850 MHz	100 kHz	–71 dBm (Note 1)
	2 010 MHz ≤ f ≤ 2 025 MHz	1 MHz	–65 dBm
	2 300 MHz ≤ f ≤ 2 400 MHz	1 MHz	–65 dBm

NOTE 1 – The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table A2-A-2-b are permitted for each UTRA absolute radio frequency channel number (UARFCN) used in the measurement.

NOTE 2 – This requirement is only applicable when UE operating in 1 900-1 920 MHz of band a.

NOTE 3 – This requirement is only applicable when UE operating in 2 010-2 025 MHz of band a.

NOTE 4 – This requirement is only applicable when UE operating in 1 930-1 990 MHz of band b.

NOTE 5 – This requirement is only applicable when UE operating in 1 850-1 910 MHz of band b.

TABLE A3-4.1-b (*end*)

c) Additional spurious emissions requirements (7.68 Mchip/s TDD option)

Frequency bandwidth	Measurement bandwidth	Minimum requirement (dBm)
921 MHz ≤ f < 925 MHz	100 kHz	–60 (Note 1)
925 MHz ≤ f ≤ 935 MHz	100 kHz	–67 (Note 1)
935 MHz < f ≤ 960 MHz	100 kHz	–79 (Note 1)
1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	–71 (Note 1)
2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–37 (Note 1)
1 884.5 MHz ≤ f ≤ 1 919.6 MHz	300 kHz	–41 (Note 2)

NOTE 1 – The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table A3-4.1-a are permitted for each absolute RF channel used in the measurement.

NOTE 2 – Applicable for transmission in 2 010-2 025 MHz.

4.2 Transmitter spurious emissions for E-UTRA

For E-UTRA, the spurious emission limits apply for frequency ranges that are more than Δf_{OOB} (MHz) from the edge of the channel bandwidth (Table A3-4.2-a).

TABLE A3-4.2-a

Boundary between E-UTRA Δf_{OOB} and spurious emission domain

Channel bandwidth	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Δf_{OOB} (MHz)	2.8	6	10	15	20	25

The spurious emission limits in Table A3-4.2-b apply for all E-UTRA transmitter band configurations and channel bandwidths.

TABLE A3-4.2-b

General spurious emissions requirements for E-UTRA

Frequency band	Measurement bandwidth	Minimum requirement (dBm)
9 kHz ≤ f < 150 kHz	1 kHz	–36
150 kHz ≤ f < 30 MHz	10 kHz	–36
30 MHz ≤ f < 1 000 MHz	100 kHz	–36
1 GHz ≤ f < 12.75 GHz	1 MHz	–30

TABLE A3-4.2-c

Spurious emissions requirements for UE coexistence in E-UTRA bands

E-UTRA band	Spurious emission						
	Protected band	Frequency range (MHz)			Level (dBm)	Bandwidth (MHz)	Comment
33	E-UTRA Bands 1, 3, 7, 8, 20, 34, 38, 39, 40	FDL_low	–	FDL_high	–50	1	Note 2
34	E-UTRA Bands 1, 3, 7, 8, 9, 11, 20, 21, 33, 38, 39, 40	FDL_low	–	FDL_high	–50	1	Note 2
	Frequency range	860	–	895	–50	1	
	Frequency range	1 884.5	–	1 919.6	–41	0.3	Note 3
	Frequency range	1 884.5	–	1 915.7			Note 4
35							
36							
37			–				
38	E-UTRA Bands 1, 3, 33, 34	FDL_low	–	FDL_high	–50	1	
39	E-UTRA Bands 34, 40	FDL_low	–	FDL_high	–50	1	
40	E-UTRA Bands 1, 3, 33, 34, 39	FDL_low	–	FDL_high	–50	1	

NOTE 1 – FDL_low and FDL_high refer to each E-UTRA frequency band specified in Note 3 of *recommends* 1.

NOTE 2 – For non-synchronized TDD operation to meet these requirements some restriction will be needed for either the operating band or protected band.

NOTE 3 – Applicable when coexistence with PHS system operating in 1 884.5-1 919.6 MHz.

NOTE 4 – Applicable when coexistence with PHS system operating in 1 884.5-1 915.7 MHz.

4.2.1 Additional spurious emissions

This requirement is specified in term of an additional spectrum emission requirement. Additional spurious emission requirements are signalled by the network to indicate that the UE shall meet an additional requirement for a specific deployment scenario as part of the cell handover/broadcast message.

When "NS_05" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table A3-4.2.1. This requirement also applies for the frequency ranges that are less than Δf_{OOB} (MHz) in Table A3-4.2-a from the edge of the channel bandwidth.

TABLE A3-4.2.1

Additional requirements (PHS)

Frequency band (MHz)	Channel bandwidth/Spectrum emission limit (dBm)				Measurement bandwidth
	5 MHz	10 MHz	15 MHz	20 MHz	
$1\,884.5 \leq f \leq 1\,919.6$[*1]	–41	–41	–41	–41	300 kHz
$1\,884.5 \leq f \leq 1\,915.7$[*2]	–41	–41	–41	–41	300 kHz

NOTE 1 – Applicable when the lower edge of the assigned E-UTRA UL channel bandwidth frequency is larger than or equal to the upper edge of PHS band (1 919.6 MHz) + 4 MHz + the Channel BW assigned. Operations below this point are for further study.

NOTE 2 – Applicable when the lower edge of the assigned EUTRA UL channel bandwidth frequency is larger than or equal to the upper edge of PHS band (1 915.7 MHz) + 4 MHz + the Channel BW assigned, where Channel BW. Operations below this point are for further study.

For measurement conditions at the edge of each frequency range, the lowest frequency of the measurement position in each frequency range should be set at the lowest boundary of the frequency range plus MBW/2. The highest frequency of the measurement position in each frequency range should be set at the highest boundary of the frequency range minus MBW/2. MBW denotes the measurement bandwidth (300 kHz).

5 Receiver spurious emissions (conducted)

5.1 Receiver spurious emissions for UTRA

For UTRA, the power of any spurious emissions from the receiver should not exceed the limits given in Tables A3-5.1 a) to A3-5.1 d).

TABLE A3-5.1

a) Receiver spurious emission requirements (3.84 Mchip/s UTRA TDD option)

Band	Maximum level	Measurement bandwidth	Note
30 MHz-1 GHz	–57 dBm	100 kHz	
1 GHz-1.9 GHz and 1.92 GHz-2.01 GHz and 2.025 GHz-2.11 GHz and 2.17 GHz-2.57 GHz	–47 dBm	1 MHz	
1.9 GHz-1.92 GHz and 2.01 GHz-2.025 GHz and 2.11 GHz-2.170 GHz and 2.57 GHz-2.69 GHz	–60 dBm	3.84 MHz	
2.69 GHz-12.75 GHz	–47 dBm	1 MHz	

TABLE A3-5.1 (*continued*)

b) Receiver spurious emission requirements (1.28 Mchip/s UTRA TDD option)

Frequency band	Measurement bandwidth	Maximum level	Note
30 MHz ≤ f < 1 GHz	100 kHz	–57 dBm	
1 GHz ≤ f ≤ 12.75 GHz	1 MHz	–47 dBm	

c) Receiver spurious emission requirements (7.68 Mchip/s UTRA TDD option)

Band	Maximum level	Measurement bandwidth	Note
30 MHz-1 GHz	–57 dBm	100 kHz	
1 GHz-1.9 GHz and 1.92 GHz-2.01 GHz and 2.025 GHz-2.11 GHz and 2.17 GHz-2.57 GHz	–47 dBm	1 MHz	With the exception of frequencies between 25 MHz below the first carrier frequency and 25 MHz above the last carrier frequency used by the MS
1.9 GHz-1.92 GHz and 2.01 GHz-2.025 GHz and 2.11 GHz-2.170 GHz and 2.57 GHz-2.69 GHz	–57 dBm	7.68 MHz	With the exception of frequencies between 25 MHz below the first carrier frequency and 25 MHz above the last carrier frequency used by the MS
2.69 GHz-12.75 GHz	–47 dBm	1 MHz	

d) Additional receiver spurious emission requirements (1.28 Mcps TDD Option)

Band	Frequency band	Measurement bandwidth	Maximum level	Note
a	2 010 MHz ≤ f ≤ 2 025 MHz	1.28 MHz	–64 dBm	
	2 570 MHz ≤ f ≤ 2 620 MHz	1.28 MHz	–64 dBm	
	2 300 MHz ≤ f ≤ 2 400 MHz	1.28 MHz	–64 dBm	
	1 880 MHz ≤ f ≤ 1 920 MHz	1.28 MHz	–64 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–60 dBm	
b	1 850 MHz ≤ f ≤ 1 910 MHz	1.28 MHz	–64 dBm	
	1 910 MHz ≤ f ≤ 1 990 MHz	1.28 MHz	–64 dBm	
c	1 910 MHz ≤ f ≤ 1 930 MHz	1.28 MHz	–64 dBm	
d	2 570 MHz ≤ f ≤ 2 620 MHz	1.28 MHz	–64 dBm	
	2 010 MHz ≤ f ≤ 2 025 MHz	1.28 MHz	–64 dBm	
	2 110 MHz ≤ f ≤ 2 170 MHz	3.84 MHz	–60 dBm	
	2 620 MHz ≤ f ≤ 2 690 MHz	3.84 MHz	–60 dBm	

TABLE A3-5.1 (*end*)

Band	Frequency band	Measurement bandwidth	Maximum level	Note
e	2 300 MHz ≤ *f* ≤ 2 400 MHz	1.28 MHz	–64 dBm	
	2 010 MHz ≤ *f* ≤ 2 025 MHz	1.28 MHz	–64 dBm	
	1 880 MHz ≤ *f* ≤ 1 920 MHz	1.28 MHz	–64 dBm	
f	1 880 MHz ≤ *f* ≤ 1 920 MHz	1.28 MHz	–64 dBm	
	2 010 MHz ≤ *f* ≤ 2 025 MHz	1.28 MHz	–64 dBm	
	2 300 MHz ≤ *f* ≤ 2 400 MHz	1.28 MHz	–64 dBm	

5.2 Receiver spurious emissions for E-UTRA

The power of any narrowband CW spurious emission shall not exceed the maximum level specified in Table A3-5.2.

TABLE A3-5.2

General receiver spurious emission requirements for E-UTRA

Frequency band	Measurement bandwidth	Maximum level	Note
30 MHz ≤ *f* < 1 GHz	100 kHz	–57 dBm	
1 GHz ≤ *f* ≤ 12.75 GHz	1 MHz	–47 dBm	

Annex 4

TDMA Single-Carrier (UWC-136) mobile 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 A4-A-1-a.

TABLE A4-A-1-a

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 A4-A-1-b.

TABLE A4-A-1-b

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 A4-A-2.

TABLE A4-A-2

MS spurious emission limits

Band (f)[1]	Maximum level (dBm)	Measurement bandwidth	Note
9 kHz ≤ f ≤ 150 kHz	–36	1 kHz	(2)
150 kHz < f ≤ 30 MHz	–36	10 kHz	(2)
30 MHz < f ≤ 1 000 MHz	–36	100 kHz	(2)
1 000 MHz < f < 1 920 MHz	–30	1 MHz	(2)
1 920 MHz ≤ f ≤ 1 980 MHz	–30	30 kHz	(3)
1 980 MHz < f < 2 110 MHz	–30	1 MHz	(2)
2 110 MHz ≤ f ≤ 2 170 MHz	–70	30 kHz	(4)
2 170 MHz < f ≤ 12.75 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 A4-A-2.1.

TABLE A4-A-2.1

Additional spurious emissions requirements

Service	Frequency band	Measurement bandwidth (kHz)	Limit (dBm)
R-GSM	921 ≤ *f* ≤ 925 MHz	100	–60
R-GSM	925 < *f* ≤ 935 MHz	100	–67
GSM 900/R-GSM	935 < *f* ≤ 960 MHz	100	–79
DCS 1800	1 805 ≤ *f* ≤ 1 880 MHz	100	–71
UTRA TDD	1 900 ≤ *f* ≤ 1 920 MHz	100	–62
UTRA TDD	2 010 ≤ *f* ≤ 2 025 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 A4-A-3.

TABLE A4-A-3

General receiver spurious emission requirements

Frequency band	Measurement bandwidth	Maximum level (dBm)	Note
30 MHz ≤ *f* < 1 GHz	100 kHz	–57	
1 GHz ≤ *f* ≤ 12.75 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 Tables A1-5.1-a (Annex 1), A2-A-4-c (Annex 2) and A3-5.1 (Annex 3)).

Part B

Conformance requirements (200 kHz)

The 200 kHz channel provides packet data service and employs both 8-level phase shift keying (8-PSK) and Gaussian minimum shift keying (GMSK) modulations.

1 Spectrum mask

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 MS due to the effects of modulation and power ramping.

The specifications contained in this subclause 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 level of the output RF spectrum due to GMSK and 8-PSK modulations should be no more than that given in Tables A4-B-2-a and A4-B-2-b.
– The level of the output RF spectrum due to switching transients should be no more than that given in Table A4-B-3.
– The power emitted should not exceed –71 dBm in frequency band 2 110-2 170 MHz.

2 Spectrum due to the modulation and wideband noise

The output RF modulation spectrum is specified in Tables A4-B-2-a and A4-B-2-b. This specification applies for all RF channels supported by the equipment.

The specification applies to the entire relevant transmit band and up to 2 MHz either side.

The limits should be met under the following measurement conditions:

– 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.
– When tests are done in frequency hopping mode, the averaging should include only bursts transmitted when the hopping carrier corresponds to the nominal carrier of the measurement. The limits then apply to the measurement results for any of the hopping frequencies.

The figures in Table A4-B-2-a, 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 1 – 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.

TABLE A4-B-2-a

Relative maximum level due to modulation

Carrier power (dBm)	Frequency offset (kHz)							
	100	200	250	400	≥ 600 < 1 200	≥ 1 200 < 1 800	≥ 1 800 < 6 000	≥ 6 000
≥ 33	+0.5	–30	–33	–60	–60	–60	–68	–76
32	+0.5	–30	–33	–60	–60	–60	–67	–75
30	+0.5	–30	–33	–60	–60[(1)]	–60	–65	–73
28	+0.5	–30	–33	–60	–60[(1)]	–60	–63	–71
26	+0.5	–30	–33	–60	–60[(1)]	–60	–61	–69
≤ 24	+0.5	–30	–33	–60	–60[(1)]	–60	–59	–67

(1) For equipment supporting 8-PSK, the requirement for 8-PSK modulation is –54 dB.

The following exceptions should apply, using the same measurement conditions as specified above:

– In the combined range of 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, exception levels of up to –36 dBm are allowed.

– 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, exception levels of up to –36 dBm are allowed.

Using the same measurement conditions as specified above, if a requirement in Table A4-B-2-a results in lower than the power limit given in Table A4-B-2-b, then the latter should be applied instead.

TABLE A4-B-2-b

Absolute maximum level due to modulation

Frequency offset from the carrier (kHz)	Level (dBm)
< 600	–36
≥ 600, <1 800	–56
≥ 1 800	–51

3 Spectrum due to switching transients

These 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. Table A4-B-3 specifies the limits.

TABLE A4-B-3

Maximum levels due to switching transients

Carrier power level (dBm)	Maximum level measured at various frequency offsets			
	400 kHz	600 kHz	1 200 kHz	1 800 kHz
39	–21 dBm	–26 dBm	–32 dBm	–36 dBm
≤ 37	–23 dBm	–26 dBm	–32 dBm	–36 dBm

NOTE 1 – The relaxation for carrier power level 39 dBm is in line with the modulated spectra and thus causes negligible additional interference to an analogue system by an UWC-136 200 kHz signal.

NOTE 2 – The near-far dynamics with this specification has been estimated to be approximately 58 dB for MS operating at a power level of 8 W or 49 dB for MSs operating at a power level of 1 W. The near-far dynamics then gradually decreases by 2 dB per power level down to 32 dB for MSs operating in cells with a maximum allowed output power of 20 mW or 29 dB for MS operating at 10 mW.

NOTE 3 – The possible performance degradation due to switching transient leaking into the beginning or the end of a burst, was estimated and found to be acceptable with respect to the BER due to co-channel interference, *C*/*I*.

4 Transmitter spurious emissions (conducted)

The power of any spurious emission should not exceed the limits specified in Table A4-B-4.

TABLE A4-B-4

MS spurious emission limits

Band (f)[1]	Measurement bandwidth	Maximum level (dBm)	Note
9 kHz ≤ f ≤ 150 kHz	1 kHz	–36	(2)
150 kHz < f ≤ 30 MHz	10 kHz	–36	(2)
30 MHz < f ≤ 1 000 MHz	100 kHz	–36	(2)
1 000 MHz < f < 1 920 MHz	1 MHz	–30	(2)
1 920 MHz ≤ f ≤ 1 980 MHz	100 kHz	–36	(3)
1 980 MHz < f < 2 110 MHz	1 MHz	–30	(2)
2 110 MHz ≤ f ≤ 2 170 MHz	100 kHz	–66	(4)
2 170 MHz < f ≤ 12.75 GHz	1 MHz	–30	(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.

5 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.

The power of any spurious emission should not exceed the limits specified in Table A4-B-5.

TABLE A4-B-5

Additional spurious emissions requirements

Service	Frequency band	Measurement bandwidth (kHz)	Minimum requirement (dBm)
R-GSM	921 ≤ f ≤ 925 MHz	100	–60
R-GSM	925 < f ≤ 935 MHz	100	–67
GSM 900/R-GSM	935 < f ≤ 960 MHz	100	–79
DCS 1800	1 805 ≤ f ≤ 1 880 MHz	100	–71
UTRA TDD	1 900 ≤ f ≤ 1 920 MHz	100	–62
UTRA TDD	2 010 ≤ f ≤ 2 025 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.

6 Receiver spurious emissions (idle mode)

The power of any spurious emissions should not exceed the limits given in Table A4-B-6.

TABLE A4-B-6

General receiver spurious emission requirements

Frequency band	Measurement bandwidth	Maximum level (dBm)	Note
30 MHz ≤ f < 1 GHz	100 kHz	–57	
1 GHz ≤ f ≤ 12.75 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 Tables 5 (Annex 1), 21 (Annex 2) and 26 (Annex 3)).

Annex 5

FDMA/TDMA (digital enhanced cordless telecommunications (DECT)) mobile 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 Ra (K, L, M, N) in successive frames, the power in physical channel Ra (K, L, Y, N) should be less than the values given in Table A5-2.

TABLE A5-2

Emissions modulation

Emissions on RF channel "*Y*"	Measurement bandwidth	Maximum power level
$Y = M \pm 1$	(1)	160 µW (–8 dBm)
$Y = M \pm 2$	(1)	1 µW (–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 A5-3.

TABLE A5-3

Emissions due to transmitter transients

Emissions on RF channel "*Y*"	Measurement bandwidth	Maximum power level
$Y = M \pm 1$	(1)	250 µW (–6 dBm)
$Y = M \pm 2$	(1)	40 µW (–14 dBm)
$Y = M \pm 3$	(1)	4 µW (–24 dBm)
Y = any other DECT channel	(1)	1 µW (–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 A5-4.1. The requirements of Table A5-4.1 are only applicable for frequencies which are greater than 12.5 MHz away from the centre frequency, f_c, of a carrier.

TABLE A5-4.1

Spurious emissions requirements

Frequency	Minimum requirement/ Reference bandwidth
30 MHz ≤ f < 1 000 MHz	–36 dBm/100 kHz
1 GHz ≤ f < 12.75 GHz	–30 dBm/1 MHz
f_c – 12.5 MHz < f < f_c + 12.5 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 A5-5.1.

TABLE A5-5.1

Receiver spurious emissions

Frequency band	Measurement bandwidth	Maximum level (dBm)	Note
30 MHz ≤ f < 1 GHz	100 kHz[1]	–57	
1 GHz ≤ f ≤ 12.75 GHz	1 MHz[1]	–47	With the exception of the frequencies within the DECT band, covered by Table A5-5.2

[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 A5-5.2.

TABLE A5-5.2

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 mobile stations

This Annex defines the unwanted emission limits for IMT-2000 OFDMA TDD WMAN mobile stations.

1 Spectrum emission mask

1.1 Default spectrum emission mask

Unless otherwise specified in sub sections of Section 1 for specific bands, the spectrum masks of Tables A6-1.1-a and A6-1.1-b are applicable.

TABLE A6-1.1-a

Default spectrum emission mask for 5 MHz carrier

Δf offset 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 A6-1.1-b

Default spectrum emission mask for 10 MHz carrier

Offset 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 2.550 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.

1.2 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 mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the mobile station centre frequency for the 10 MHz carrier. For mobile station with 8.75 MHz channel bandwidth, the spectrum emissions mask applies to frequencies between 4.77 MHz and 21.875 MHz away from the centre frequency.

Tables A6-1.2-a to A6-1.2-d specify the spectrum emission for TDD mobile stations with 10, 5 and 8.75 MHz channel bandwidths.

TABLE A6-1.2-a

Spectrum emission mask for 10 MHz carrier

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth)
1	5 to < 6	100	–13.00
2	6 to < 10	1 000	–13.00
3	10 to < 11	1 000	$-13 - 12(\Delta f - 10)$
4	11 to < 15	1 000	–25.00
5	15 to < 20	1 000	–25.00
6	20 to < 25	1 000	–25.00

In Table A6-1.2-a:

– Channel bandwidth is 10 MHz.

– Integration bandwidth refers to the frequency range over which the emission power is integrated.

Δf: is defined as the frequency offset in MHz from the channel centre frequency.

TABLE A6-1.2-b

Spectrum emission mask for 5 MHz carrier

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth)
1	2.5 to < 3.5	50	–13.00
2	3.5 to < 7.5	1 000	–13.00
3	7.5 to < 8	500	–16.00
4	8 to < 10.4	1 000	–25.00
5	10.4 to < 12.5	1 000	–25.00

In Table A6-1.2-b:

– Channel bandwidth is 5 MHz.

– Integration bandwidth refers to the frequency range over which the emission power is integrated.

For all combination of transmit power and centre frequencies, the spectral mask measurements shall not exceed the limits specified in Tables A6-1.2-a and A6-1.2-b for 10 and 5 MHz channel bandwidth sizes respectively.

The specification of Tables A6-1.2-c and A6-1.2-d are attenuations of out of band emission per integration bandwidth relative to the transmit power calculated over the same frequency interval as integration bandwidth.

TABLE A6-1.2-c

Spectrum emission mask for 8.75 MHz carrier for *PTx* < 23 dBm

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Specification
1	4.77 to < 9.27	100	–(26+7×(|Δ*f*|–4.77)/4.5) dB
2	9.27 to < 13.23	100	–(33+4×(|Δ*f*|–9.27)/3.96) dB
3	13.23 to < 17.73	100	–(37+2×(|Δ*f*|–13.23)/4.5) dB
4	17.73 to < 21.875	100	–39 dB

TABLE A6-1.2-d

Spectrum emission mask for 8.75 MHz carrier for *PTx* ≥ 23 dBm

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Specification
1	4.77 to < 9.27	100	–((*PTx*-23)+26+7×(|Δ*f*|–4.77)/4.5) dB
2	9.27 to < 13.23	100	–((*PTx*-23)+33+4×(|Δ*f*|–9.27)/3.96) dB
3	13.23 to < 17.73	100	–((*PTx*-23)+37+2×(|Δ*f*|–13.23)/4.5) dB
4	17.73 to < 21.875	100	–(*PTx*-23)+39 dB

In Tables A6-1.2-c and A6-1.2-d:

PTx: is the measured power in dBm into the antenna and

Δ*f*: is defined as the frequency offset in MHz from the channel centre frequency.

1.3 Spectrum emission mask for TDD equipment operating in the band 2 500-2 690 MHz (BCG 3.A)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the mobile station centre frequency for the 10 MHz carrier.

Tables A6-1.3-a and A6-1.3-b specify the spectrum emission for TDD mobile stations with 10 and 5 MHz channel bandwidths.

TABLE A6-1.3-a

Spectrum emission mask for 10 MHz carrier

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth)
1	5 to < 6	100	–13.00
2	6 to < 10	1 000	–13.00
3	10 to < 11	1 000	$-13 - 12(\Delta f - 10)$
4	11 to < 15	1 000	–25.00
5	15 to < 20	1 000	If $PTx \leq +23$ dBm and $2\,550 \leq f_c \leq 2\,620$ MHz then $-21 - 32/19 \times (\Delta f - 10.5)$ else –25
6	20 to < 25	1 000	If $PTx \leq +23$ dBm and $2\,550 \leq f_c \leq 2\,620$ MHz then –37 else –25

NOTE 1 – Maximum transmitter output power of mobile station is 23 dBm or smaller in Japan, and the frequency band of operation is limited to 2 545-2 625 MHz.

In Table A6-1.3-a:

– The channel bandwidth is 10 MHz.

– Integration bandwidth refers to the frequency range over which the emission power is integrated.

Δf: is defined as the frequency offset in MHz from the channel centre frequency

PTx: is the measured power in dBm into the antenna and

f_c: is the channel centre frequency in MHz.

TABLE A6-1.3-b

Spectrum emission mask for 5 MHz carrier

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth)
1	2.5 to < 3.5	50	–13.00
2	3.5 to < 7.5	1 000	–13.00
3	7.5 to < 8	500	If $PTx \leq +23$ dBm and $2\,547.5 \leq f_c \leq 2\,622.5$ MHz then $-23 - 2.28 \times (\Delta f - 7.5)$ else –16.00
4	8 to < 10.4	1 000	–25.00
5	10.4 to < 12.5	1 000	If $PTx \leq +23$ dBm and $2\,547.5 \leq f_c \leq 2\,622.5$ MHz then $-21 - 1.68 \times (\Delta f - 8)$ else –25

NOTE 1 – Maximum transmitter output power of mobile station is 23 dBm or smaller in Japan, and the frequency band of operation is limited to 2 545-2 625 MHz.

In Table A6-1.3-b:

– the channel bandwidth is 5 MHz.

– Integration bandwidth refers to the frequency range over which the emission power is integrated.

PTx: is the measured power in dBm into the antenna

Δf: is defined as the frequency offset in MHz from the channel centre frequency and

f_c: is the channel centre frequency in MHz.

1.4 Spectrum emission mask for TDD equipment operating in the band 3 400-3 600 MHz (BCG 5L.A/5L.B/5L.C)

1.4.1 5 MHz channel bandwidth

The spectrum emission mask of the mobile station applies to frequency offsets between 2.5 MHz and 12.5 MHz on both sides of the mobile station centre carrier frequency. The out-of-channel emission is specified as power level measured over the specified measurement bandwidth relative to the total mean power of the mobile station carrier measured in the 5 MHz channel.

Table A6-1.4.1 specifies the spectrum emission for TDD mobile stations with 5 MHz channel bandwidth. The mobile station emission shall not exceed the levels specified in Table A6-1.4.1. Assuming specific power classes, relative requirements of Table A6-1.4.1 can be converted to absolute values for testing purposes. A test tolerance value of 1.5 dB is included here.

TABLE A6-1.4.1

Spectrum emission mask requirement for 5 MHz channel bandwidth

Frequency offset Δf	Minimum requirement	Measurement bandwidth
2.5 MHz to 3.5 MHz	$\left\{-33.5-15\times\left(\frac{\Delta f}{\text{MHz}}-2.5\right)\right\}$dBc	30 kHz
3.5 to 7.5 MHz	$\left\{-33.5-1\times\left(\frac{\Delta f}{\text{MHz}}-3.5\right)\right\}$dBc	1 MHz
7.5 to 8.5 MHz	$\left\{-37.5-10\times\left(\frac{\Delta f}{\text{MHz}}-7.5\right)\right\}$dBc	1 MHz
8.5 to 12.5 MHz	–47.5 dBc	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 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 3.485 MHz.

NOTE 3 – The first measurement position with a 1 MHz filter is at Δf equals to 4 MHz; the last is at Δf equals to 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 4 – Note that equivalent PSD type mask can be derived by applying 10*log ((5 MHz)/(30 kHz))= 22.2 dB and 10*log((5 MHz)/(1 MHz))= 7 dB scaling factor for 30 kHz and 1 MHz measurement bandwidth respectively.

1.4.2 7 MHz channel bandwidth

The spectrum emission mask of the mobile station applies to frequency offsets between 3.5 MHz and 17.5 MHz on both sides of the mobile station centre carrier frequency. The out-of-channel emission is specified as power level measured over the specified measurement bandwidth relative to the total mean power of the mobile station carrier measured in the 7 MHz channel.

Table A6-1.4.2 specifies the spectrum emission for TDD mobile stations with 7 MHz channel bandwidth. The mobile station emission shall not exceed the levels specified in Table A6-1.4.2. Assuming specific power classes, relative requirements of Table A6-1.4.2 can be converted to absolute values. A test tolerance value of 1.5 dB is included here.

TABLE A6-1.4.2

Spectrum emission mask requirement for 7 MHz channel bandwidth

Frequency offset Δf	Minimum requirement	Measurement bandwidth
3.5 MHz to 4.75 MHz	$\left\{-33.5-13.5\times\left(\frac{\Delta f}{\text{MHz}}-3.5\right)\right\}$ dBc	30 kHz
4.75 to 10.5 MHz	$\left\{-35.0-0.7\times\left(\frac{\Delta f}{\text{MHz}}-4.75\right)\right\}$ dBc	1 MHz
10.5 to 11.9 MHz	$\left\{-39.0-7\times\left(\frac{\Delta f}{\text{MHz}}-10.5\right)\right\}$ dBc	1 MHz
11.9 to 17.5 MHz	–49.0 dBc	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 30 kHz filter is at Δf equals to 3.515 MHz; the last is at Δf equals to 4.735 MHz.

NOTE 3 – The first measurement position with a 1 MHz filter is at Δf equals to 5.25 MHz; the last is at Δf equals to 17 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 4 – Note that equivalent PSD type mask can be derived by applying 10*log ((7 MHz)/(30 kHz))= 23.7 dB and 10*log((7 MHz)/(1 MHz))= 8.5 dB scaling factor for 30 kHz and 1 MHz measurement bandwidth respectively.

1.4.3 10 MHz channel bandwidth

The spectrum emission mask of the mobile station applies to frequency offsets between 5.0 MHz and 25.0 MHz on both sides of the mobile station centre carrier frequency. The out-of-channel emission is specified as power level measured over the specified measurement bandwidth relative to the total mean power of the mobile station carrier measured in the 10 MHz channel.

Table A6-1.4.3 specify the spectrum emission for TDD mobile stations with 10 MHz channel bandwidth. The mobile station emission shall not exceed the levels specified in Table A6-1.4.3. Assuming specific power classes, relative requirements of Table A6-1.4.3 can be converted to absolute values. A test tolerance value of 1.5 dB is included here.

TABLE A6-1.4.3

Spectrum emission mask requirement for 10 MHz channel bandwidth

Frequency offset Δf	Minimum requirement	Measurement bandwidth
5.0 MHz to 7.0 MHz	$\left\{-33.5-9\times\left(\frac{\Delta f}{\text{MHz}}-5.0\right)\right\}$dBc	30 kHz
7.0 to 15.0 MHz	$\left\{-36.5-0.5\times\left(\frac{\Delta f}{\text{MHz}}-7.0\right)\right\}$dBc	1 MHz
15.0 to 17.0 MHz	$\left\{-36.5-0.5\times\left(\frac{\Delta f}{\text{MHz}}-7.0\right)\right\}$dBc	1 MHz
17.0 to 25.0 MHz	–50.5 dBc	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 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 6.985 MHz.

NOTE 3 – The first measurement position with a 1 MHz filter is at Δf equals to 7.5 MHz; the last is at Δf equals to 24.5 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 4 – Equivalent PSD type mask can be derived by applying 10*log ((10 MHz)/(30 kHz))= 25.2 dB and 10*log((10 MHz)/(1 MHz))= 10 dB scaling factor for 30 kHz and 1 MHz measurement bandwidth respectively.

1.5 Spectrum emission mask for TDD equipment operating in the bands 3 600-3 800 MHz (BCG 5H.A/5H.B/5H.C)

1.5.1 5 MHz channel bandwidth

The spectrum emission mask of the mobile station applies to frequency offsets between 2.5 MHz and 12.5 MHz on both sides of the mobile station centre carrier frequency. The out-of-channel emission is specified as power level measured over the specified measurement bandwidth relative to the total mean power of the mobile station carrier measured in the 5 MHz channel.

Table A6-1.5.1 specifies the spectrum emission for TDD mobile stations with 5 MHz channel bandwidth. The mobile station emission shall not exceed the levels specified in Table A6-1.5.1. Assuming specific power classes, relative requirements of Table A6-1.5.1 can be converted to absolute values for testing purposes. A test tolerance value of 1.5 dB is included here.

TABLE A6-1.5.1

Spectrum emission mask requirement for 5 MHz channel bandwidth

Frequency offset Δf	Minimum requirement	Measurement bandwidth
2.5 MHz to 3.5 MHz	$\left\{-33.5-15\times\left(\frac{\Delta f}{\text{MHz}}-2.5\right)\right\}$dBc	30 kHz
3.5 to 7.5 MHz	$\left\{-33.5-1\times\left(\frac{\Delta f}{\text{MHz}}-3.5\right)\right\}$dBc	1 MHz
7.5 to 8.5 MHz	$\left\{-37.5-10\times\left(\frac{\Delta f}{\text{MHz}}-7.5\right)\right\}$dBc	1 MHz
8.5 to 12.5 MHz	–47.5 dBc	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 30 kHz filter is at Δf equals to 2.515 MHz; the last is at Δf equals to 3.485 MHz.

NOTE 3 – The first measurement position with a 1 MHz filter is at Δf equals to 4 MHz; the last is at Δf equals to 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 4 – Note that equivalent PSD type mask can be derived by applying 10*log ((5 MHz)/(30 kHz))= 22.2 dB and 10*log((5 MHz)/(1 MHz))= 7 dB scaling factor for 30 kHz and 1 MHz measurement bandwidth respectively.

1.5.2 7 MHz channel bandwidth

The spectrum emission mask of the mobile station applies to frequency offsets between 3.5 MHz and 17.5 MHz on both sides of the mobile station centre carrier frequency. The out-of-channel emission is specified as power level measured over the specified measurement bandwidth relative to the total mean power of the mobile station carrier measured in the 7 MHz channel.

Table A6-1.5.2 specifies the spectrum emission for TDD mobile stations with 7 MHz channel bandwidth. The mobile station emission shall not exceed the levels specified in Table A6-1.5.2. Assuming specific power classes, relative requirements of Table A6-1.5.2 can be converted to absolute values. A test tolerance value of 1.5 dB is included here.

TABLE A6-1.5.2

Spectrum emission mask requirement for 7 MHz channel bandwidth

Frequency offset Δf	Minimum requirement	Measurement bandwidth
3.5 MHz to 4.75 MHz	$\left\{-33.5-13.5\times\left(\frac{\Delta f}{\text{MHz}}-3.5\right)\right\}$ dBc	30 kHz
4.75 to 10.5 MHz	$\left\{-35.0-0.7\times\left(\frac{\Delta f}{\text{MHz}}-4.75\right)\right\}$ dBc	1 MHz
10.5 to 11.9 MHz	$\left\{-39.0-7\times\left(\frac{\Delta f}{\text{MHz}}-10.5\right)\right\}$ dBc	1 MHz
11.9 to 17.5 MHz	–49.0 dBc	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 30 kHz filter is at Δf equals to 3.515 MHz; the last is at Δf equals to 4.735 MHz.

NOTE 3 – The first measurement position with a 1 MHz filter is at Δf equals to 5.25 MHz; the last is at Δf equals to 17 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 4 – Note that equivalent PSD type mask can be derived by applying 10*log ((7 MHz)/(30 kHz))= 23.7 dB and 10*log((7 MHz)/(1 MHz))= 8.5 dB scaling factor for 30 kHz and 1 MHz measurement bandwidth respectively.

1.5.3 10 MHz channel bandwidth

The spectrum emission mask of the mobile station applies to frequency offsets between 5.0 MHz and 25.0 MHz on both sides of the mobile station centre carrier frequency. The out-of-channel emission is specified as power level measured over the specified measurement bandwidth relative to the total mean power of the mobile station carrier measured in the 10 MHz channel.

Table A6-1.5.3 specify the spectrum emission for TDD mobile stations with 10 MHz channel bandwidth. The mobile station emission shall not exceed the levels specified in Table A6-1.5.3. Assuming specific power classes, relative requirements of Table A6-1.5.3 can be converted to absolute values. A test tolerance value of 1.5 dB is included here.

TABLE A6-1.5.3

Spectrum emission mask requirement for 10 MHz channel bandwidth

Frequency offset Δf	Minimum requirement	Measurement bandwidth
5.0 MHz to 7.0 MHz	$\left\{-33.5-9\times\left(\frac{\Delta f}{\text{MHz}}-5.0\right)\right\}$dBc	30 kHz
7.0 to 15.0 MHz	$\left\{-36.5-0.5\times\left(\frac{\Delta f}{\text{MHz}}-7.0\right)\right\}$dBc	1 MHz
15.0 to 17.0 MHz	$\left\{-40.5-5\times\left(\frac{\Delta f}{\text{MHz}}-15.0\right)\right\}$dBc	1 MHz
17.0 to 25.0 MHz	–50.5 dBc	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 30 kHz filter is at Δf equals to 5.015 MHz; the last is at Δf equals to 6.985 MHz.

NOTE 3 – The first measurement position with a 1 MHz filter is at Δf equals to 7.5 MHz; the last is at Δf equals to 24.5 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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 4 – Equivalent PSD type mask can be derived by applying 10*log ((10 MHz)/(30 kHz))= 25.2 dB and 10*log((10 MHz)/(1 MHz))= 10 dB scaling factor for 30 kHz and 1 MHz measurement bandwidth respectively.

1.6 Spectrum emission mask for FDD equipment operating in the bands 1 710-1 770/2 110-2 170 MHz (BCG 6A)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the mobile station centre frequency for the 10 MHz carrier.

Tables A6-1.6-a and A6-1.6-b specify the spectrum emission for FDD mobile stations with 10 and 5 MHz channel bandwidths.

TABLE A6-1.6-a

Spectrum emission mask requirement for 10 MHz channel bandwidth

Segment number	Offset from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
1	5 to < 6	100	–13.00
2	6 to ≤ 25	1 000	–13.00

TABLE A6-1.6-b

Spectrum emission mask requirement for 5 MHz channel bandwidth

Segment number	Offset from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration BW) at the antenna port
1	2.5 to < 3.5	50	–13
2	3.5 to ≤ 12.5	1 000	–13

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.

1.7 Spectrum emission mask for FDD equipment operating in the bands 1 920-1 980/2 110-2 170 MHz (BCG 6.B)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the mobile station centre frequency for the 10 MHz carrier.

Table A6-1.7-a and Table A6-1.7-b specify the spectrum emission for FDD mobile stations with 5 and 10 MHz channel bandwidths.

TABLE A6-1.7-a

Spectrum emission mask for 5 MHz carrier

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth)
1	2.5 to < 3.5	30	–15.00
2	3.5 to < 5.0	1 000	–10.00
3	5.0 to < 7.5	1 000	–10.00
4	7.5 to < 8.5	1 000	–13.00
5	8.5 to < 12.5	1 000	–25.00

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 3.485 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 A6-1.7-b

Spectrum emission mask for 10 MHz carrier

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth)
1	5.0 to < 6.0	30	–18.00
2	6.0 to < 7.5	1 000	–10.00
3	7.5 to < 10.0	1 000	–10.00
4	10.0 to < 11.0	1 000	–13.00
5	11.0 to < 15.0	1 000	–13.00
6	15.0 to < 25.0	1 000	–25.00

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 5.015 MHz; the last is at Δf equals to 5.985 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.

1.8 Spectrum emission mask for FDD equipment operating in the band 2 496-2 690 MHz (BCG 3.B)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the mobile station centre frequency for the 10 MHz carrier.

Tables A6-1.8-a and A6-1.8-b specify the spectrum emission for FDD mobile stations with 10 and 5 MHz channel bandwidths.

TABLE A6-1.8-a

Spectrum emission mask for 10 MHz carrier

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth)
1	5 to < 6	100	–13.00
2	6 to < 10	1 000	–13.00
3	10 to < 11	1 000	$-13 - 12(\Delta f - 10)$
4	11 to < 15	1 000	–25.00
5	15 to < 20	1 000	–25.00
6	20 to < 25	1 000	–25.00

In Table A6-1.8-a:

– Channel bandwidth is 10 MHz.

– Integration bandwidth refers to the frequency range over which the emission power is integrated.

Δf: is defined as the frequency offset in MHz from the channel centre frequency

PTx: is the measured power in dBm into the antenna

f_c: is the channel centre frequency in MHz.

TABLE A6-1.8-b

Spectrum emission mask for 5 MHz carrier

Segment number	Offset from channel centre frequency (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth)
1	2.5 to < 3.5	50	–13.00
2	3.5 to < 7.5	1 000	–13.00
3	7.5 to < 8	1 000	–16.00
4	8 to < 10.4	1 000	–25.00
5	10.4 to < 12.5	1 000	–25.00

In Table A6-1.8-b:

– Channel bandwidth is 5 MHz.

– Integration bandwidth refers to the frequency range over which the emission power is integrated.

PTx: is the measured power in dBm into the antenna

Δf: is defined as the frequency offset in MHz from the channel centre frequency

f_c: is the channel centre frequency in MHz.

1.9 Spectrum emission mask for FDD equipment operating in the bands 1 710-1 785/1 805-1 880 MHz (BCG 6.C)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the mobile station centre frequency for the 10 MHz carrier.

Table A6-1.9-a and Table A6-1.9-b specify the spectrum emission for FDD mobile stations with 5 and 10 MHz channel bandwidths.

TABLE A6-1.9-a

Spectrum emission mask for 5 MHz carrier

Offset 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 < 7.5	1 000	–10
7.5 to < 8.5	1 000	–13
8.5 to < 12.5	1 000	–25

TABLE A6-1.9-b

Spectrum emission mask for 10 MHz carrier

Offset from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
5.0 to < 6.0	50	–13
6.0 to < 10.0	1 000	–10
10.0 to < 11.0	1 000	–13
11.0 to < 25.0	1 000	–25

1.10 Spectrum emission mask for TDD equipment operating in the bands 698-862 MHz (BCG 7.A)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile 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 for the 10 MHz carrier.

Table A6-1.10-a to Table A6-1.10-f specify the spectrum emission for FDD mobile stations with 5, 7 and 10 MHz channel bandwidths.

TABLE A6-1.10-a

Spectrum emission mask for 5 MHz carrier – $700.5 \leq f_c \leq 795.5$

Frequency 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 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 A6-1.10-b

Spectrum emission mask for 5 MHz carrier – $799.5 \leq f_c \leq 859.5$

Frequency offset Δf from channel centre (MHz)	Integration bandwidth (MHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
2.5 to 7.5	5	1.6
7.5 to 12.5	2	–10

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The measurement position with a 5 MHz filter is at Δf equals to 5 MHz. The first measurement position with a 2 MHz filter is at Δf equals to 8.5 MHz; the last is at Δf equals to 11.5 MHz.

TABLE A6-1.10-c

Spectrum emission mask for 7 MHz carrier – 701.5 ≤ f_c ≤ 794.5

Frequency 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 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 A6-1.10-d

Spectrum emission mask for 7 MHz carrier – 800.5 ≤ f_c ≤ 858.5

Frequency offset Δf from channel centre (MHz)	Integration bandwidth (MHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
3.5 to 8.5	5	1.6
8.5 to 17.5	2	–10

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The measurement position with a 5 MHz filter is at Δf equals to 6 MHz. The first measurement position with a 2 MHz filter is at Δf equals to 9.5 MHz; the last is at Δf equals to 16.5 MHz.

TABLE A6-1.10-e

Spectrum emission mask for 10 MHz carrier – 703 ≤ f_c ≤ 793

Frequency 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 25.0	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 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.

TABLE A6-1.10-f

Spectrum emission mask for 10 MHz carrier – 802 ≤ f_c ≤ 857

Frequency offset Δf from channel centre (MHz)	Integration bandwidth (MHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
5 to 10	5	1.6
10 to 25	2	–10

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The measurement position with a 5 MHz filter is at Δf equals to 7.5 MHz. The first measurement position with a 2 MHz filter is at Δf equals to 11 MHz; the last is at Δf equals to 24 MHz.

1.11 Spectrum emission mask for FDD equipment operating in the bands 776-787/746-757 MHz (BCG 7.B)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz away from the mobile station centre frequency for the 10 MHz carrier.

Table A6-1.11-a and Table A6-1.11-b specify the spectrum emission for FDD mobile stations with 5 and 10 MHz channel bandwidths.

TABLE A6-1.11-a

Spectrum emission mask for 5 MHz carrier

Frequency 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 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 A6-1.11-b

Spectrum emission mask for 10 MHz carrier

Frequency 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 25.0	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 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.

1.12 Spectrum emission mask for FDD equipment operating in the bands 788-793/758-763 and 793-798/763-768 MHz (BCG 7.C)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz.

Table A6-1.12 specifies the spectrum emission for FDD mobile stations with 5 MHz channel bandwidth.

TABLE A6-1.12

Spectrum emission mask for 5 MHz carrier

Frequency 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 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.

1.13 Spectrum emission mask for FDD equipment operating in the bands 788-798/758-768 MHz (BCG 7.D)

The spectrum emission mask of mobile station applies to frequencies between 5 MHz and 25 MHz away from the mobile station centre frequency for the 10 MHz channel bandwidth.

Table A6-1.13 specifies the spectrum emission for FDD mobile stations with 10 MHz channel bandwidth.

TABLE A6-1.13

Spectrum emission mask for 10 MHz carrier

Frequency 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 25.0	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 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.

1.14 Spectrum emission mask for FDD and TDD equipment operating in the bands 698-862 MHz (BCG 7.E)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 3.5 MHz and 17.5 MHz for the 10 MHz carrier, and between 5 MHz and 25 MHz for the 10 MHz carrier.

Table A6-1.14-a to Table A6-1.14-f specify the spectrum emission for FDD and TDD mobile stations with 5, 7 and 10 MHz channel bandwidths.

TABLE A6-1.14-a

Spectrum emission mask for 5 MHz carrier – 700.5 ≤ f_c ≤ 795.5

Frequency 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 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 A6-1.14-b

Spectrum emission mask for 5 MHz carrier – 799.5 ≤ f_c ≤ 859.5

Frequency offset Δf from channel centre (MHz)	Integration bandwidth (MHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
2.5 to 7.5	5	1.6
7.5 to 12.5	2	–10

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The measurement position with a 5 MHz filter is at Δf equals to 5 MHz. The first measurement position with a 2 MHz filter is at Δf equals to 8.5 MHz; the last is at Δf equals to 11.5 MHz.

TABLE A6-1.14-c

Spectrum emission mask for 7 MHz carrier – 701.5 ≤ f_c ≤ 794.5

Frequency 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 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 A6-1.14-d

Spectrum emission mask for 7 MHz carrier – $800.5 \leq f_c \leq 858.5$

Frequency offset Δf from channel centre (MHz)	Integration bandwidth (MHz)	Allowed emission level (dBm/Integration Bandwidth) as measured at the antenna port
3.5 to 8.5	5	1.6
8.5 to 13.5	2	–10
13.5 to 17.5	1	–25

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The measurement position with a 5 MHz filter is at Δf equals to 6 MHz. The first measurement position with a 2 MHz filter is at Δf equals to 9.5 MHz; the last is at Δf equals to 12.5 MHz. The first measurement position with a 1 MHz filter is at Δf equals to 14 MHz; the last is at Δf equals to 17 MHz.

NOTE 3 – The emission level of Segment 3 is only applicable when $835.5 \leq f_c \leq 858.5$.

TABLE A6-1.14-e

Spectrum emission mask for 10 MHz carrier – $703 \leq f_c \leq 793$

Frequency 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 25.0	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 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.

TABLE A6-1.14-f

Spectrum emission mask for 10 MHz carrier – $802 \leq f_c \leq 857$

Frequency offset Δf from channel centre (MHz)	Integration bandwidth (MHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
5 to 10	5	1.6
10 to 15	2	–10
15 to 25	1	–25

NOTE 1 – Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2 – The measurement position with a 5 MHz filter is at Δf equals to 7.5 MHz. The first measurement position with a 2 MHz filter is at Δf equals to 11 MHz; the last is at Δf equals to 14 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 – The emission level of Segment 3 is only applicable when $837 \leq f_c \leq 857$.

1.15 Spectrum emission mask for FDD equipment operating in the bands 880-915/925-960 MHz (BCG 7.F)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz for the 10 MHz carrier.

Table A6-1.15-a and Table A6-1.15-b specify the spectrum emission for FDD mobile stations with 5 and 10 MHz channel bandwidths.

TABLE A6-1.15-a

Spectrum emission mask for 5 MHz carrier

Offset 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 < 7.5	1 000	–10
7.5 to < 8.5	1 000	–13
8.5 to ≤ 12.5	1 000	–25

TABLE A6-1.15-b

Spectrum emission mask for 10 MHz carrier

Offset from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration bandwidth) as measured at the antenna port
5.0 to < 6.0	50	–13
6.0 to < 10.0	1 000	–10
10.0 to < 11.0	1 000	–13
11.0 to ≤ 25.0	1 000	–25

1.16 Spectrum emission mask for TDD equipment operating in the bands 1 785-1 805, 1 880-1 920, 1 910-1 930, 2 010-2 025, and 1 900-1 920 MHz (BCG 8.A)

The spectrum emission mask of mobile station applies to frequencies between 2.5 MHz and 12.5 MHz away from the mobile station centre frequency for the 5 MHz carrier and between 5 MHz and 25 MHz for the 10 MHz carrier.

Table A6-1.16-a and Table A6-1.16-b specify the spectrum emission for TDD mobile stations with 5 and 10 MHz channel bandwidths.

TABLE A6-1.16-a

Spectrum emission mask for 5 MHz carrier

Offset from channel centre (MHz)	Integration bandwidth (kHz)	Allowed emission level (dBm/integration BW) at the antenna port
2.5 to < 3.5	50	–13
3.5 to < 7.5	1 000	–10
73.5 to ≤ 8.5	1 000	–13
8.5 to ≤ 12.5	1 000	–25

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 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 MHz.

TABLE A6-1.16-b

Spectrum emission mask for 10 MHz carrier

Offset 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 < 10	1 000	–10
106 to ≤ 15	1 000	–13
15 to ≤ 25	1 000	–25

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 5.050 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.

2 Transmitter spurious emissions (conducted)

2.1 Default spurious emissions

Unless otherwise specified in sub sections of Section 2 for specific bands, the default spurious emission specifications of Table A6-2.1 are applicable.

TABLE A6-2.1

Default spurious emissions – relevant to $F_{UL\text{-}le} + ChBW/2 \leq f_c \leq F_{UL\text{-}ue} - ChBW/2$

Spurious frequency (f) range	Measurement bandwidth		Maximum emission level (dBm)
9 kHz ≤ f < 150 kHz	1 kHz		–36
150 kHz ≤ f < 30 MHz	10 kHz		–36
30 MHz ≤ f < 1 000 MHz	100 kHz		–36
1 GHz ≤ f < 5 x F_{ue}	30 kHz 300 kHz 1 MHz	If 2.5xChBW ≤ Δf < 10xChBW If 10xChBW MHz ≤ Δf < 12xChBW If 12xChBW ≤ Δf	–30

2.2 Spurious emissions for TDD equipment operating in the band 2 300-2 400 MHz (BCG 1.A/1.B)

The limits shown in Tables A6-2.2-a to A6-2.2-c are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table | Δf | 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 A6-2.2-a to A6-2.2-c specify the spurious emission for TDD mobile stations with 5, 8.75 and 10 MHz channel bandwidths.

TABLE A6-2.2-a

Spurious emissions for 5 MHz channel size; relevant to 2 302.5 MHz ≤ f_c ≤ 2 397.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth		Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz		–36
2	150 kHz ≤ f < 30 MHz	10 kHz		–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz		–36
4	1 GHz ≤ f < 19 GHz	30 kHz 300 kHz 1 MHz	If 12.5 ≤ | Δf | < 50 If 50 ≤ | Δf | < 60 If 60 ≤ |Δf |	–30

TABLE A6-2.2-b

Spurious emissions for 8.75 MHz channel bandwidth

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)
1	30 MHz ≤ f < 1 000 MHz	100 kHz	–13
2	1 GHz ≤ f ≤ 12 GHz	1 MHz	–13

TABLE A6-2.2-c

Spurious emissions for 10 MHz channel size; relevant to 2 305 MHz ≤ f_c ≤ 2 395 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz	–36
2	150 kHz ≤ f < 30 MHz	10 kHz	–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz	–36
4	1 GHz ≤ f < 19 GHz	30 kHz If 25 ≤ | Δf | < 100 300 kHz If 100 ≤ | Δf | < 120 1 MHz If 120 ≤ |Δf |	–30

TABLE A6-2.2-d

Additional spurious emissions for 5 MHz channel size; relevant to 2 302.5 ≤ f_c ≤ 2 397.5 (BCG 1.B)

No	Spurious frequency (f) range (MHz)	Measurement bandwidth (MHz)	Maximum emission level (dBm)
1	2 110 ≤ f < 2 170	1	–50
2	1 805 ≤ f < 1 880	1	–50
3	2 496 ≤ f < 2 690	1	–50
4	925 ≤ f < 960	1	–50
5	1 900 ≤ f < 1 920	1	–50
6	2 010 ≤ f < 2 025	1	–50
7	2 570 ≤ f < 2 620	1	–50
8	791≤ f < 821	1	–50

TABLE A6-2.2-e

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	$2\,110 \leq f < 2\,170$	1	–50
2	$1\,805 \leq f < 1\,880$	1	–50
3	$2\,496 \leq f < 2\,690$	1	–50
4	$925 \leq f < 960$	1	–50
5	$1\,900 \leq f < 1\,920$	1	–50
6	$2\,010 \leq f < 2\,025$	1	–50
7	$2\,570 \leq f < 2\,620$	1	–50
8	$791 \leq f < 821$	1	–50

2.3 Spurious emissions for TDD equipment operating in the band 2 500-2 690 MHz (BCG 3.A)

IMT-2000 OFDMA TDD WMAN mobile station complies with the limits recommended in Recommendation ITU-R SM.329-10. The limits for the 5 MHz carrier, shown in Tables A6-2.3-a, A6-2.3-b and A6-2.3-c are only applicable for frequency offsets which are greater than 12.5 MHz away from the mobile station centre frequency, while the limits for the 10 MHz carrier shown in Tables A6-2.3-d, A6-2.3-e and A6-2.3-f apply only for frequency offsets greater than 25 MHz. f is the frequency of the spurious domain emissions. f_c is the mobile station centre frequency.

Tables A6-2.3-a, A6-2.3-b, A6-2.3-c, A6-2.3-d, A6-2.3-e and A6-2.3-f specify the general and additional spurious emission for TDD mobile stations with 5 and 10 MHz channel bandwidths.

TABLE A6-2.3-a

General mobile station spurious emissions limit for 5 MHz channel size; relevant to 2 502.5 MHz $\leq f_c \leq$ 2 687.5 MHz

Band	Measurement bandwidth		Allowed emission level (dBm)
9 kHz $\leq f <$ 150 kHz	1 kHz		–36
150 kHz $\leq f <$ 30 MHz	10 kHz		–36
30 MHz $\leq f <$ 1 000 MHz	100 kHz		–36
1 GHz $\leq f <$ 13.45 GHz	30 kHz 300 kHz 1 MHz	If 12.5 MHz $\leq \lvert f_c - f \rvert <$ 50 MHz If 50 MHz $\leq \lvert f_c - f \rvert <$ 60 MHz If 60 MHz $\leq \lvert f_c - f \rvert$	–30

TABLE A6-2.3-b

Additional mobile station spurious emission limit for 5 MHz channel size; the requirements of Table are relevant to 2 547.5 MHz ≤ f_c ≤ 2 622.5 MHz

Frequency bandwidth	Measurement bandwidth	Minimum requirement (dBm)	Note
1 000 MHz ≤ f < 2 505 MHz	1 MHz	–13	
2 505 MHz ≤ f < 2 530 MHz	1 MHz	–37	
2 530 MHz ≤ f < 2 535 MHz	1 MHz	1.7f – 4 338	
2 535 MHz ≤ f < 2 630 MHz	1 MHz	–21 – 1.68*(Δf – 8) 12.5 MHz < Δf < 17.5 MHz –37 17.5 MHz < Δf < 22.5 MHz –18 22.5 MHz < Δf	
2 630 MHz ≤ f < 2 630.5 MHz	1 MHz	–13 – 8/3.5 × (f – 2 627)	
2 630.5 MHz ≤ f < 2 640 MHz	1 MHz	–21 – 16/9.5× (f – 2 630.5)	
2 640 MHz ≤ f < 2 655 MHz	1 MHz	–37	
2 655 MHz ≤ f	1 MHz	–13	

NOTE 1 – The allowed emission level shall be applied for the frequency range greater than 2.5 times the channel size from the centre frequency. Δf is the offset from channel centre frequency.

NOTE 2 – This additional requirement provides for the protection of satellite systems in the bands 2 500-2 535 MHz and 2 630-2 690 MHz in Japan, and applies only to terminals operating in the frequency band 2 545-2 625 MHz with powers of 23 dBm or smaller.

TABLE A6-2.3-c

Additional mobile station spurious emissions for 5 MHz channel size; relevant to 2 502.5 MHz ≤ f_c ≤ 2 687.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)
1	2 620 MHz ≤ f < 2 690 MHz	1 MHz	–40

NOTE 1 – This additional requirement is for the purpose of compliance to ETSI EN 302-544-2.

TABLE A6-2.3-d

General mobile station spurious emissions limit for 10 MHz channel size; relevant to 2 505 MHz ≤ f_c ≤ 2 685 MHz

Spurious frequency (f) range	Measurement bandwidth	Allowed emission level (dBm)
9 kHz ≤ f <150 kHz	1 kHz	–36
150 kHz ≤ f < 30 MHz	10 kHz	–36
30 MHz ≤ f < 1 000 MHz	100 kHz	–36
1 GHz ≤ f < 13.45 GHz	30 kHz If 25 ≤ $\lvert f_c - f \rvert$ < 100 300 kHz If 100 ≤ $\lvert f_c - f \rvert$ < 120 1 MHz If 120 ≤ $\lvert f_c - f \rvert$	–30

TABLE A6-2.3-e

Additional mobile station spurious emission limit for 10 MHz channel size, the requirements of Table are relevant to 2 550 MHz ≤ f_c ≤ 2 620 MHz

Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)	Note
1 000 MHz ≤ f < 2 505 MHz	1 MHz	–13	
2 505 MHz ≤ f < 2 530 MHz	1 MHz	–37	
2 530 MHz ≤ f < 2 535 MHz	1 MHz	$1.7f$ – 4 338	
2 535 MHz ≤ f < 2 630 MHz	1 MHz	–18 25 MHz < Δf	
2 630 MHz ≤ f < 2 630.5 MHz	1 MHz	–13 – 8/3.5 × (f – 2 627)	
2 630.5 MHz ≤ f < 2 640 MHz	1 MHz	–21 – 16/9.5 × (f – 2 630.5)	
2 640 MHz ≤ f < 2 655 MHz	1 MHz	–37	
2 655 MHz ≤ f	1 MHz	–13	

NOTE 1 – The allowed emission level shall be applied for the frequency range greater than 2.5 times the channel size from the centre frequency. Δf is the offset from channel centre frequency.

NOTE 2 – This additional requirement provides for the protection of satellite systems in the bands 2 500-2 535 MHz and 2 630-2 690 MHz in Japan, and applies only to terminals operating in the frequency band 2 5452 625 MHz with powers of 23 dBm or smaller.

TABLE A6-2.3-f

Additional mobile station spurious emissions for 10 MHz channel size; relevant to 2 505 MHz ≤ f_c ≤ 2 685 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)
1	2 620 MHz ≤ f < 2 690 MHz	1 MHz	–40

NOTE 1 – This additional requirement is for the purpose of compliance to ETSI EN 302-544-2.

2.4 Spurious emission for TDD equipment operating in the band 3 400-3 600 MHz (BCG 5L.A/5L.B/5L.C)

The limits shown in Tables A6-2.4-a to A6-2.4-c are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table $|\Delta f|$ 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 A6-2.4-a to A6-2.4-c specify the spurious emission for TDD mobile stations with 5, 7 and 10 MHz channel bandwidths.

TABLE A6-2.4-a

Spurious emissions for 5 MHz channel size; relevant to 3 402.5 MHz ≤ f_c ≤ 3 797.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth		Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz		–36
2	150 kHz ≤ f < 30 MHz	10 kHz		–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz		–36
4	1 GHz ≤ f < 19 GHz	30 kHz 300 kHz 1 MHz	If 12.5 MHz ≤ $\|\Delta f\|$ < 50 MHz If 50 MHz ≤ $\|\Delta f\|$ < 60 MHz If 60 MHz ≤ $\|\Delta f\|$	–30

TABLE A6-2.4-b

Spurious emissions for 7 MHz channel size; relevant to 3 403.5 MHz ≤ f_c ≤ 3 796.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth		Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz		–36
2	150 kHz ≤ f < 30 MHz	10 kHz		–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz		–36
4	1 GHz ≤ f < 19 GHz	30 kHz 300 kHz 1 MHz	If 17.5 MHz ≤ $\|\Delta f\|$ < 70 MHz If 70 MHz ≤ $\|\Delta f\|$ < 84 MHz If 84 MHz ≤ $\|\Delta f\|$	–30

TABLE A6-2.4-c

Spurious emissions for 10 MHz channel size; relevant to 3 405 MHz ≤ f_c ≤ 3 795 MHz

Row	Spurious frequency (f) range	Measurement bandwidth		Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz		–36
2	150 kHz ≤ f < 30 MHz	10 kHz		–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz		–36
4	1 GHz ≤ f < 19 GHz	30 kHz 300 kHz 1 MHz	If 25 MHz ≤ | Δf | < 100 MHz If 100 MHz ≤ | Δf | < 120 MHz If 120 MHz ≤ | Δf |	–30

2.5 Spurious emissions for TDD equipment operating in the band 3 600-3 800 MHz (BCG 5H.A/5H.B/5H.C)

The limits shown in Tables A6-2.5-a to A6-2.5-c are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table | Δf | 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 A6-2.5-a to A6-2.5-c specify the spurious emission for TDD mobile stations with 5, 7 and 10 MHz channel bandwidths.

TABLE A6-2.5-a

Spurious emissions for 5 MHz channel size; relevant to 3 402.5 MHz ≤ f_c ≤ 3 797.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth		Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz		–36
2	150 kHz ≤ f < 30 MHz	10 kHz		–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz		–36
4	1 GHz ≤ f < 19 GHz	30 kHz 300 kHz 1 MHz	If 12.5 MHz ≤ | Δf | < 50 MHz If 50 MHz ≤ | Δf | < 60 MHz If 60 MHz ≤ | Δf |	–30

TABLE A6-2.5-b

Spurious emissions for 7 MHz channel size; relevant to 3 403.5 MHz ≤ f_c ≤ 3 796.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth		Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz		–36
2	150 kHz ≤ f < 30 MHz	10 kHz		–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz		–36
4	1 GHz ≤ f < 19 GHz	30 kHz 300 kHz 1 MHz	If 17.5 MHz ≤ | Δf | < 70 MHz If 70 MHz ≤ | Δf | < 84 MHz If 84 MHz ≤ | Δf |	–30

TABLE A6-2.5-c

Spurious emissions for 10 MHz channel size; relevant to 3 405 MHz ≤ f_c ≤ 3 795 MHz

Row	Spurious frequency (f) range	Measurement bandwidth		Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz		–36
2	150 kHz ≤ f < 30 MHz	10 kHz		–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz		–36
4	1 GHz ≤ f < 19 GHz	30 kHz 300 kHz 1 MHz	If 25 MHz ≤ | Δf | < 100 MHz If 100 MHz ≤ | Δf | < 120 MHz If 120 MHz ≤ | Δf |	–30

2.6 Spurious emissions for FDD equipment operating in the band 1 710-1 770/2 110-2 170 MHz (BCG 6.A)

The limits shown in Tables A2-A-1.1-c to A2-A-1.2-b are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table | Δf | 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 A6-2.6-a and A6-2.6-b specify the spurious emission for FDD mobile stations with 5 and 10 MHz channel bandwidths.

TABLE A6-2.6-a

Spurious emissions for 5 MHz channel size; relevant to 1 712.5 MHz ≤ f_c ≤ 1 752.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	30 MHz ≤ f < 8.775 GHz, 12.5 MHz ≤ | Δf |	1 MHz	–13

TABLE A6-2.6-b

Spurious emissions for 5 MHz channel size; relevant to 1 715 MHz ≤ f_c ≤ 1 750 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	30 MHz ≤ f < 8.775 GHz, 25 MHz ≤ | Δf |	1 MHz	–13

2.7 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 A6-2.7-a to A6-2.7-d are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Tables | Δf | 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 A6-2.7-a to A6-2.7-b specify the spurious emission for FDD mobile stations with 5 and 10 MHz channel bandwidths, while Table A6-2.7-c and Table A6-2.7-d specified the additional spurious emission limits for 5 and 10 MHz channel bandwidths.

TABLE A6-2.7-a

Spurious emissions for 5 MHz channel size; relevant to 1 922.5 MHz ≤ f_c ≤ 1 977.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz	–36
2	150 kHz ≤ f < 30 MHz	10 kHz	–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz	–36
4	1 GHz ≤ f < 9.9 GHz, 12.5 ≤ | Δf |	1 MHz	–30

TABLE A6-2.7-b

Spurious emissions for 10 MHz channel size; relevant to 1 925 MHz ≤ f_c ≤ 1 975 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz	–36
2	150 kHz ≤ f < 30 MHz	10 kHz	–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz	–36
4	1 GHz ≤ f < 19 GHz, 25 ≤ | Δf |	1 MHz	–30

TABLE A6-2.7-c

Additional spurious emissions for 5 MHz channel size; relevant to 1 922.5 MHz ≤ f_c ≤ 1 977.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)
1	2 110-2 170 MHz	1 MHz	–50
2	1 805-1 880 MHz	1 MHz	–50
3	2 620-2 690 MHz	1 MHz	–50
4	925-960 MHz	1 MHz	–50
5	1 844.9-1 879.9 MHz	1 MHz	–50
6	1 475.9-1 500.9 MHz	1MHz	–50
7	1 900-1 920 MHz	1 MHz	–50
8	2 010-2 025 MHz	1 MHz	–50
9	2 570-2 620 MHz	1 MHz	–50
10	1 880-1 920 MHz	1 MHz	–50
11	2 300-2 400 MHz	1 MHz	–50
12	860-895 MHz	1 MHz	–50
13	1 884.5-1 919.6 MHz	300 kHz	–41

TABLE A6-2.7-d

Additional spurious emissions for 10 MHz channel size; relevant to 1 925 MHz ≤ f_c ≤ 1 975 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)
1	2 110-2 170 MHz	1 MHz	–50
2	1 805-1 880 MHz	1 MHz	–50
3	2 620-2 690 MHz	1 MHz	–50
4	925-960 MHz	1 MHz	–50
5	1 844.9-1 879.9 MHz	1 MHz	–50
6	1 475.9-1 500.9 MHz	1 MHz	–50
7	1 900-1 920 MHz	1 MHz	–50
8	2 010-2 025 MHz	1 MHz	–50
9	2 570-2 620 MHz	1 MHz	–50
10	1 880-1 920 MHz	1 MHz	–50
11	2 300-2 400 MHz	1 MHz	–50
12	860-895 MHz	1 MHz	–50
13	1 884.5-1 919.6 MHz	300 kHz	–41

2.8 Spurious emissions for FDD equipment operating in the band 2 496-2 690 MHz (BCG 3.B)

The limits shown in Tables A6-2.8-a to A6-2.8-d are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table $|\Delta f|$ 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 A6-2.8-a to A6-2.8-d specify the spurious emission for FDD mobile stations with 5 and 10 MHz channel bandwidths.

TABLE A6-2.8-a

Spurious emissions for 5 MHz channel size; relevant to 2 498.5 MHz ≤ f_c ≤ 2 687.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth		Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz		–36
2	150 kHz ≤ f < 30 MHz	10 kHz		–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz		–36
4	1 GHz ≤ f < 13.45 GHz	30 kHz 300 kHz 1 MHz	If 12.5 ≤ $\|\Delta f\|$ < 50 If 50 ≤ $\|\Delta f\|$ < 60 If 60 ≤ $\|\Delta f\|$	–30

TABLE A6-2.8-b

Spurious emissions for 10 MHz channel size; relevant to 2 501 MHz ≤ f_c ≤ 2 685 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum specification (dBm)
1	9 kHz ≤ f < 150 kHz	1 kHz	–36
2	150 kHz ≤ f < 30 MHz	10 kHz	–36
3	30 MHz ≤ f < 1 000 MHz	100 kHz	–36
4	1 GHz ≤ f < 13.45 GHz	30 kHz If 25 ≤ | Δf | < 100 300 kHz If 100 ≤ | Δf | < 120 1 MHz If 120 ≤ | Δf |	–30

TABLE A6-2.8-c

Additional spurious emissions for 5 MHz channel size; relevant to 2 498.5 MHz ≤ f_c ≤ 2 687.5 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)
1	2 110-2 170 MHz	1 MHz	–50
2	1 805-1 880 MHz	1 MHz	–50
3	2 620-2 690 MHz	1 MHz	–50
4	925-960 MHz	1 MHz	–50
5	1 900-1 920 MHz	1 MHz	–50
6	2 010-2 025 MHz	1 MHz	–50
7	2 570-2 620 MHz	1 MHz	–50

TABLE A6-2.8-d

Additional spurious emissions for 10 MHz channel size; relevant to 2 501 MHz ≤ f_c ≤ 2 685 MHz

Row	Spurious frequency (f) range	Measurement bandwidth	Minimum requirement (dBm)
1	2 110-2 170 MHz	1 MHz	–50
2	1 805-1 880 MHz	1 MHz	–50
3	2 620-2 690 MHz	1 MHz	–50
4	925-960 MHz	1 MHz	–50
5	1 900-1 920 MHz	1 MHz	–50
6	2 010-2 025 MHz	1 MHz	–50
7	2 570-2 620 MHz	1 MHz	–50

2.9 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 A6-2.9-a and A6-2.9-b are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table $|\Delta f|$ 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.

TABLE A6-2.9-a

Spurious emissions

Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range	Integration bandwidth	Maximum emission level (dBm)
1 710-1 785	9 kHz ≤ f < 150 kHz	1 kHz	–36
1 710-1 785	150 kHz ≤ f < 30 MHz	10 kHz	–36
1 710-1 785	30 MHz ≤ f < 1 000 MHz	100 kHz	–36
1 710-1 785	1 GHz ≤ f < 12.75 GHz	30 kHz If 12.5 MHz ≤ Δf < 50 MHz 300 kHz If 50 MHz ≤ Δf < 60 MHz 1 MHz If 60 MHz ≤ Δf	–30

TABLE A6-2.9-b

Additional spurious emissions

No	Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range (MHz)	Measurement bandwidth (MHz)	Maximum emission level (dBm)
	1 710-1 785	925-960	1	–50
		1 475.9-1 500.9	1	–50
		1 805-1 880	1	–50
		1 844.9-1 879.9	1	–50
		1 900-1 920	1	–50
		2 010-2 025	1	–50
		2 110-2 170	1	–50
		2 570-2 620	1	–50
		2 620-2 690	1	–50
		791-821	1	–50

2.10 Spurious emissions for TDD equipment operating in the band 698-862 MHz (BCG 7.A)

The limits shown in Tables A6-2.10-a and A6-2.10-b are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table $|\Delta f|$ 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.

TABLE A6-2.10-a

Spurious emissions for 5 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
698-798	$30 \le f < 4310$ (12.5 MHz $\le \Delta f$)	100	–13
746-758, 776-788	$763 \le \Delta f \le 775$, $793 \le \Delta f \le 805$	6.25	–35
758-763, 763-768, 788-793, 793-798	$769 \le \Delta f \le 775$, $799 \le \Delta f \le 805$	6.25	–35
797-862	$797 \le f \le 862$ (12.5 MHz $\le \Delta f$)	5 000	–37
797-862	$790 \le f \le 791$	1 000	–44
797-862	$470 \le f \le 790$	8 000	–65

TABLE A6-2.10-b

Spurious emissions for 7 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
698-798	$30 \le f < 4310$ (17.5 MHz $\le \Delta f$)	100	–13
746-758, 776-788	$763 \le \Delta f \le 775$, $793 \le \Delta f \le 805$	6.25	–35
758-768, 788-798	$769 \le \Delta f \le 775$, $799 \le \Delta f \le 805$	6.25	–35
797-862	$797 \le f \le 862$ (17.5 MHz $\le \Delta f$)	5 000	–37
797-862	$790 \le f \le 791$	1 000	–44
797-862	$470 \le f \le 790$	8 000	–65

TABLE A6-2.10-c

Spurious emissions for 10 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
698-798	$30 \le f < 4310$ (25 MHz ≤ Δf)	100	–13
746-758, 776-788	$763 \le \Delta f \le 775$, $793 \le \Delta f \le 805$	6.25	–35
758-768, 788-798	$769 \le \Delta f \le 775$, $799 \le \Delta f \le 805$	6.25	–35
797-862	$797 \le f \le 862$ (25 MHz ≤ Δf)	5 000	–37
797-862	$790 \le f \le 791$	1 000	–44
797-862	$470 \le f \le 790$	8 000	–65

2.11 Spurious emissions for FDD equipment operating in the band 776-787/746-757 MHz (BCG 7.B)

The limits shown in Tables A6-2.11-a and A6-2.11-b are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table $|\Delta f|$ 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.

TABLE A6-2.11-a

Spurious emissions for 5 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
776-787	$30 \le f < 4\,310$ (12.5 MHz ≤ Δf)	100	–13
776-787	$763 \le \Delta f \le 775$, $793 \le \Delta f \le 805$	6.25	–35

TABLE A6-2.11-b

Spurious emissions for 10 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum Emission Level (dBm)
776-787	$30 \le f < 4310$ (25 MHz ≤ Δf)	100	–13
776-787	$763 \le \Delta f \le 775$, $793 \le \Delta f \le 805$	6.25	–35

2.12 Spurious emissions for FDD equipment operating in the band 788-793/758-763 and 793-798/763-768 MHz (BCG 7.C)

The limits shown in Table A6-2.12 is for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table | Δf | 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.

TABLE A6-2.12

Spurious emissions for 5 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
788-793, 793-798	$30 \le f < 4\,310$ (12.5 MHz ≤ Δf)	100	–13
788-793, 793-798	$769 \le \Delta f \le 775$, $799 \le \Delta f \le 805$	6.25	–35

2.13 Spurious emission for FDD equipment operating in the bands 788-798/758-768 MHz (BCG 7.D)

The limits shown in Table A6-2.13 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table | Δf | 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.

In this section, measurement uncertainty (as defined in Recommendation ITU-R M.1545) values corresponding to spurious emission limits have not been included.

TABLE A6-2.13

Spurious emissions for 10 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
788-798	$30 \le f < 4\,310$ (25 MHz ≤ Δf)	100	–13
788-798	$769 \le \Delta f \le 775$, $799 \le \Delta f \le 805$	6.25	–35

2.14 Spurious emission for FDD and TDD equipment operating in the bands 698-862 MHz (BCG 7.E)

The limits shown in Tables A6-2.14-a and A6-2.14-b are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table | Δf | 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.

In this section, measurement uncertainty (as defined in Recommendation ITU-R M.1545) values corresponding to spurious emission limits have not been included.

TABLE A6-2.14-a

Spurious emissions for 5 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
698-798	$30 \le f < 4\,310$ ($12.5\ \text{MHz} \le \Delta f$)	100	–13
746-758, 776-788	$763 \le \Delta f \le 775$, $793 \le \Delta f \le 805$	6.25	–35
758-763, 763-768, 788-793, 793-798	$769 \le \Delta f \le 775$, $799 \le \Delta f \le 805$	6.25	–35
791-862	$797 \le f \le 862$ ($12.5\ \text{MHz} \le \Delta f$)	5 000	–37
797-862	$790 \le f \le 791$	1 000	–44
832-862	$821 \le f \le 862$ ($12.5\ \text{MHz} \le \Delta f$)	1 000	–25
832-862	$470 \le f \le 790$	8 000	–65

TABLE A6-2.14-b

Spurious emissions for 7 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
698-798	$30 \le f < 4\,310$ ($17.5\ \text{MHz} \le \Delta f$)	100	–13
746-758, 776-788	$763 \le \Delta f \le 775$, $793 \le \Delta f \le 805$	6.25	–35
758-763, 763-768, 788-793, 793-798	$769 \le \Delta f \le 775$, $799 \le \Delta f \le 805$	6.25	–35
797-862	$797 \le f \le 862$ ($17.5\ \text{MHz} \le \Delta f$)	5 000	–37
797-862	$790 \le f \le 791$	1 000	–44
832-862	$821 \le f \le 862$ ($17.5\ \text{MHz} \le \Delta f$)	1 000	–25
832-862	$470 \le f \le 790$	8 000	–65

TABLE A6-2.14-c

Spurious emissions for 10 MHz carrier

Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
698-798	$30 \le f < 4\,310$ ($25\ \text{MHz} \le \Delta f$)	100	–13
746-758, 776-788	$763 \le \Delta f \le 775$, $793 \le \Delta f \le 805$	6.25	–35
758-763, 763-768, 788-793, 793-798	$769 \le \Delta f \le 775$, $799 \le \Delta f \le 805$	6.25	–35
797-862	$797 \le f \le 862$ ($25\ \text{MHz} \le \Delta f$)	5 000	–37
797-862	$790 \le f \le 791$	1 000	–44
832-862	$821 \le f \le 862$ ($25\ \text{MHz} \le \Delta f$)	1 000	–25
832-862	$470 \le f \le 790$	8 000	–65

2.15 Spurious emission for FDD equipment operating in the bands 880-915/925-960 MHz (BCG 7.G)

The limits shown in Tables A6-2.15-a and A6-2.15-b are for frequency offsets which are greater than 2.5 times the channel bandwidth from the mobile station centre frequency. In the Table $|\Delta f|$ 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.

TABLE A6-2.15-a

Spurious emissions

Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range	Integration bandwidth	Maximum emission level (dBm)
880-915	$9\ \text{kHz} \le f < 150\ \text{kHz}$	1 kHz	–36
880-915	$150\ \text{kHz} \le f < 30\ \text{MHz}$	10 kHz	–36
880-915	$30\ \text{MHz} \le f < 1\,000\ \text{MHz}$	100 kHz	–36(1)
880-915	$1\ \text{GHz} \le f < 12.75\ \text{GHz}$	30 kHz If $12.5\ \text{MHz} \le \Delta f < 50\ \text{MHz}$ 300 kHz If $50\ \text{MHz} \le \Delta f < 60\ \text{MHz}$ 1 MHz If $60\ \text{MHz} \le \Delta f$	–30

TABLE A6.2.15-b

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)
1	880-915	925-960	1	–50
2		1 805-1 880	1	–50
3		1 880-1 920	1	–50
4		1 900-1 920	1	–50
5		2 010-2 025	1	–50
6		2 110-2 170	1	–50
7		2 300-2 400	1	–50
8		2 570-2 620	1	–50
9		2 620-2 690	1	–50
10		791-821	1	–50
11		782-890	8	–65

NOTE – With respect to the spurious frequencies of Lines 2 (entire range) and 9 (2 640-2 690 sub range) (entire range) of Table A6.2.15-b, exceptions in measurements are allowed for harmonic spurious emissions where the harmonics are 2nd or 3rd harmonics of in channel transmissions. In these exception cases, the maximum emission level (–36 dBm/100 kHz) is applicable.

2.16 Spurious emission for TDD equipment operating in the bands 1 785-1 805, 1 880-1 920, 1 910-1 930, 2 010-2 025, and 1 900-1 920 MHz (BCG 8.A)

The limits shown in the Table A6-2.16-a to Table A6-2.16-d are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS centre frequency. In the Table, f is the frequency of the spurious domain emissions.

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 A6-2.16-a

Spurious emission for 5 MHz carrier

Transmitter centre frequency (f_c) (MHz)	**Spurious frequency (f) range**	**Integration bandwidth**	**Maximum emission level (dBm)**
1 787.5-1 802.5 1 882.5-1 917.5 1 912.5-1 927.5 2 012.5-2 022.5 1 902.5-1 917.5	9 kHz ≤ f < 150 kHz	1 kHz	–36
1 787.5-1 802.5 1 882.5-1 917.5 1 912.5-1 927.5 2 012.5-2 022.5 1 902.5-1 917.5	150 kHz ≤ f < 30 MHz	10 kHz	–36
1 787.5-1 802.5 1 882.5-1 917.5 1 912.5-1 927.5 2 012.5-2 022.5 1 902.5-1 917.5	30 MHz ≤ f < 1 000 MHz	100 kHz	–36
1 787.5-1 802.5 1 882.5-1 917.5 1 912.5-1 927.5 2 012.5-2 022.5 1 902.5-1 917.5	1 GHz ≤ f < 12.75 GHz	30 kHz If 12.5 MHz ≤ Δf < 50 MHz 300 kHz If 50 MHz ≤ Δf < 60 MHz 1 MHz If 60 MHz ≤ Δf	–30

TABLE A6-2.16-b

Spurious emission for 10 MHz carrier

Transmitter centre frequency (f_c) (MHz)	**Spurious frequency (f) range**	**Integration bandwidth**	**Maximum emission level (dBm)**
1 790-1 800 1 885-1 915 1 915-1 925 2 015-2 020 1 905-1 915	9 kHz ≤ f < 150 kHz	1 kHz	–36
1 790-1 800 1 885-1 915 1 915-1 925 2 015-2 020 1 905-1 915	150 kHz ≤ f < 30 MHz	10 kHz	–36
1 790-1 800 1 885-1 915 1 915-1 925 2 015-2 020 1 905-1 915	30 MHz ≤ f < 1 000 MHz	100 kHz	–36
1 790-1 800 1 885-1 915 1 915-1 925 2 015-2 020 1 905-1 915	1 GHz ≤ f < 12.75 GHz	30 kHz If 12.5 MHz ≤ Δf < 50 MHz 300 kHz If 50 MHz ≤ Δf < 60 MHz 1 MHz If 60 MHz ≤ Δf	–30

TABLE A6-2.16-c

Additional spurious emission for 5 MHz carrier

Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
1 882.5-1 917.5	2 010-2 025 2 300-2 400	1 000	–50
1 902.5-1 917.5	925-960 1 880-1 920 1 930-1 990 2 010-2 025 2 110-2 170 2 300-2 400 2 570-2 620	1 000	–50
2 012.5-2 022.5	2 110-2 170 1 805-1 880 2 620-2 690 925-960 1 844.9-1 879.9 1 475.9-1 500.9 1 900-1 920 2 570-2 620 1 880-1 920 2 300-2 400	1 000	–50
	860-895	1 000	–50
	1 884.5-1 919.6	300	–41

TABLE A6-2.16-d

Additional spurious emission for 10 MHz carrier

Transmitter centre frequency (f_c) (MHz)	Spurious frequency (f) range (MHz)	Measurement bandwidth (kHz)	Maximum emission level (dBm)
1 885-1 915	2 010-2 025 2 300-2 400	1 000	–50
1 905-1 915	925-960 1 880-1 920 1 930-1 990 2 010-2 025 2 110-2 170 2 300-2 400 2 570-2 620	1 000	–50
2 015-2 020	2 110-2 170 1 805-1 880 2 620-2 690 925-960 1 844.9-1 879.9 1 475.9-1 500.9 1 900-1 920 2 570-2 620 1 880-1 920 2 300-2 400	1 000	–50
	860-895	1 000	–50
	1 884.5-1 919.6	300	–41

3 Receiver spurious emissions (conducted)

3.1 Spurious emissions for TDD equipment operating in the band 2 500-2 690 MHz (BCG 3.A)

Table A6-3.1 specifies the spurious emissions for TDD Mobile Stations with 10 and 5 MHz channel bandwidths. The power of any narrow-band spurious emission should not exceed the maximum level specified in Table A6-3.1.

TABLE A6-3.1

General receiver spurious emission requirements

Band	Measurement bandwidth		Allowed emission level (dBm)
30 MHz ≤ f < 1 GHz	100 kHz		–57
1 GHz ≤ f ≤ 13.45 GHz	30 kHz	If $2.5 \times BW \le \lvert f_c - f \rvert < 10 \times BW$	–47
	300 kHz	If $10 \times BW \le \lvert f_c - f \rvert < 12 \times BW$	
	1 MHz	If $12 \times BW \le \lvert f_c - f \rvert$	

4 Adjacent channel leakage ratio (ACLR)

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.

4.1 ACLR values for TDD equipment operating in the band 2 300-2 400 MHz (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 Table below.

TABLE A6-4.1-a

ACLR specification for 5 MHz channel BW (BCG 1.B)

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
2	MS channel centre frequency ± 5 MHz	30
3	MS channel centre frequency ± 10 MHz	44

TABLE A6-4.1-b

ACLR specifications for 10 MHz channel BW (BCG 1.B)

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
2	MS channel centre frequency ± 10 MHz	30
3	MS channel centre frequency ± 20 MHz	44

In Tables A6-4.1-a and A6-4.1-b, the measurement filter bandwidth on the adjacent channel centre frequency is 4.75 MHz for a 5 MHz channelized system and 9.5 MHz for a 10 MHz channelized system.

4.2 ACLR of TDD equipment operating in the frequency range 2 500-2 690 MHz (BCG 3.A)

In this section, data is provided that is relevant to the case where the adjacent system is OFDMA TDD WMAN (intra-system) or the case where the adjacent system is UTRA (inter-system).

ACLR is therefore specified considering the following receiver bandwidths:

When the adjacent system is OFDMA TDD WMAN:

– 4.75 MHz for a 5 MHz channelized system, and

– 9.5 MHz for a 10 MHz channelized system.

When the adjacent system is UTRA:

– 3.84 MHz for a 5 MHz channelized system, and

– 7.68 MHz for a 10 MHz channelized system.

The measurement bandwidth for the measurement of on-channel power of the OFDMA TDD WMAN carrier is:

– 4.75 MHz for a 5 MHz channelized system, and

– 9.5 MHz for a 10 MHz channelized system.

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 TDD mobile stations relevant to the two cases are provided in the Tables A6-4.2-a and A6-4.2-b for 5 and 10 MHz channel bandwidths respectively.

TABLE A6-4.2-a

ACLR for 5 MHz channel bandwidth

	Minimum required ACLR relative to assigned channel frequency (dB)	
Adjacent channel centre frequency	OFDMA TDD WMAN case	UTRA[(1)] case
MS channel centre frequency ± 5 MHz	30	33
MS channel centre frequency ± 10 MHz	44	43

[(1)] These are similar to the minimum requirements for UTRA systems (see Annexes 1 and 3 to this Recommendation) and in practice may be expected to be larger.

TABLE A6-4.2-b

ACLR for 10 MHz channel bandwidth

	Minimum required ACLR relative to assigned channel frequency (dB)	
Adjacent channel centre frequency	OFDMA TDD WMAN case	UTRA[1] case
MS channel centre frequency ± 10 MHz	30	33
MS channel centre frequency ± 20 MHz	44	43

[1] These are similar to the minimum requirements for UTRA systems (see Annexes 1 and 3 to this Recommendation) and in practice may be expected to be larger.

Additional information may be provided in future revisions of this Recommendation.

NOTE 1 – Further study is necessary for other systems wherever applicable.

4.3 ACLR of TDD equipment operating in the frequency range 3 400-3 600 MHz (BCG 5L.A/5L.B/5L.C)

In this section, data is provided that is relevant to the case where the adjacent system is OFDMA TDD WMAN (intra-system).

ACLR is therefore specified considering the following receiver bandwidth.

When the adjacent system is OFDMA TDD WMAN:

– 4.75 MHz for a 5 MHz channelized system,

– 6.7 MHz for a 7 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 OFDMA TDD WMAN carrier is:

– 4.75 MHz for a 5 MHz channelized system,

– 6.7 MHz for a 7 MHz channelized system, and

– 9.5 MHz for a 10 MHz channelized system.

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.

Tables A6-4.3-a to A6-4.3-c specify the ACLR for TDD mobile stations with 5 and 10 MHz channel bandwidths. The values listed in the Tables are applicable when the adjacent channel mean power is greater than –55 dBm.

TABLE A6-4.3-a

ACLR for 5 MHz channel bandwidths

Adjacent channel centre frequency	ACLR limit relative to assigned channel frequency (dB)
Mobile station channel centre frequency ± 5 MHz	33
Mobile station channel centre frequency ± 10 MHz	43

TABLE A6-4.3-b

ACLR for 7 MHz channel bandwidths

Adjacent channel centre frequency	ACLR limit relative to assigned channel frequency (dB)
Mobile station channel centre frequency ± 7 MHz	33
Mobile station channel centre frequency ± 14 MHz	43

TABLE A6-4.3-c

ACLR for 10 MHz channel bandwidths

Adjacent channel centre frequency	ACLR limit relative to assigned channel frequency (dB)
Mobile station channel centre frequency ± 10 MHz	33
Mobile station channel centre frequency ± 20 MHz	43

4.4 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 A6-4.4-a and A6-4.4-b below. ACLR is specified for two configurations.

In Configuration I the receiver channel bandwidth on the adjacent channel is:

– 4.75 MHz for a 5 MHz channelized system,

– 9.5 MHz for a 10 MHz channelized system.

In Configuration II the receiver channel bandwidth on the adjacent channel is:

– 3.84 MHz for a 5 MHz channelized system,

– 7.68 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 Configuration I both the transmitted power and the received power are measured with a rectangular filter. For Configuration II 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.

In Tables A6-4.4-a and A6-4.4-b, 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 A6-4.4-a

ACLR specification for 5 MHz channel BW (BCG 6.C)

No	Description	Minimum required ACLR relative to assigned channel frequency (dB)	
1	Adjacent channel centre frequency	Configuration I	Configuration II
2	MS channel centre frequency ± 5 MHz	30	33
3	MS channel centre frequency ± 10 MHz	44	43

TABLE A6-4.4-b

ACLR specifications for 10 MHz Channel BW (BCG 6.C)

No	Description	Minimum required ACLR relative to assigned channel frequency (dB)	
1	Adjacent channel centre frequency	Configuration I	Configuration II
2	MS channel centre frequency ± 10 MHz	30	33
3	MS channel centre frequency ± 20 MHz	44	43

4.5 ACLR values for FDD equipment operating in the bands 880-915/925-960 MHz (BCG 7.G)

For 5 and 10 MHz BW Band Class Group 7.G, the ACLR shall be equal to or greater than the limits specified in Tables A6-4.5-a and A6-4.5-b below. ACLR is specified for two configurations.

In Configuration I the receiver channel bandwidth on the adjacent channel is:

– 4.75 MHz for a 5 MHz channelized system,

– 9.5 MHz for a 10 MHz channelized system.

In Configuration II the receiver channel bandwidth on the adjacent channel is:

– 3.84 MHz for a 5 MHz channelized system,

– 7.68 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 Configuration I both the transmitted power and the received power are measured with a rectangular filter. For Configuration II 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.

In Tables A6-4.5-a and A6-4.5-b, 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 A6-4.5-a

ACLR specification for 5 MHz Channel BW (BCG 7.G)

No	Description	Minimum required ACLR relative to assigned channel frequency (dB)	
1	Adjacent channel centre frequency	Configuration I	Configuration II
2	MS channel centre frequency ± 5 MHz	30	33
3	MS channel centre frequency ± 10 MHz	44	43

TABLE A6-4.5-b

ACLR specifications for 10 MHz Channel BW (BCG 7.G)

No	Description	Minimum required ACLR relative to assigned channel frequency (dB)	
1	Adjacent channel centre frequency	Configuration I	Configuration II
2	MS channel centre frequency ± 10 MHz	30	33
3	MS channel centre frequency ± 20 MHz	44	43

5 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.

Appendix 1

Definition of test tolerance

Test tolerance

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